THE AMERICAN GAS LIGHT JOURNAL

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The Public Lighting Tables of the American Meter Company will be found in the page advertisement of that Company.

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[NOTICE.]

First Annual Meeting, Iowa Gas Association.

The first annual meeting of the Iowa Gas Association will be held at the Savery Hotel, Des Moines, Ia., commencing Wednesday, August 23, 1905.

PROGRAMME.

Wednesday, August 23.—Morning session, 10 A.M to 12:30 P.M. First regular business meeting; reports of committees; election of officers, etc. 12:30 to 2 P.M., recess for lunch. Afternoon session, 2 to 4:30 P.M. Continued business meeting of the Association. Evening, 6:30 P.M. Informal banquet at Savery Hotel.

Thursday, August 24.—Morning session, 10 A.M. to 12 M. Reading of papers and discussion of same:

"Complaints," by Mr. F. W. Kelley, Davenport, Ia.

"Ammoniacal Liquor," by Mr. F. E. Sherriff, Muscatine, Ia.

"Shop Practice," by Mr. G. I. Vincent, Engineer, Des Moines, Ia.

Other papers are being prepared, and will be noted in programme later. Members are invited to discuss freely all the points brought forth in these papers, as only the best work of the Association can be done by united effort and continued discussion. 12:30 to 2 P.M., recess for lunch. Afternoon session, 2 to 4:30 P.M. Reading of papers and discussion of same continued. Evening, 6:30 P.M. Entertainment in the evening will be provided, including trolley ride, attendance at the Ingersol Park, vaudeville performance.

Friday, August 25.—Morning session, 10 A.M. to 12:30 P.M. General business of the Association.

An opportunity will be afforded to visiting members of the Association to visit local gas works and attend the opening exercises of the State Fair on this day.

JANSEN HAINES,
Chairman Executive Committee.
F. W. KELLEY,
Secretary and Treasurer.

[NOTICE.]

Wrinkle Department, Ohio Gas Light Association.

OHIO GAS LIGHT ASSOCIATION,
OFFICE OF THE WRINKLE DEPT.,
719 CITIZENS BUILDING,
CLEVELAND, O., June 13, 1905.

The Wrinkle Department of the Ohio Gas Light Association is now ready to receive contributions for the 1906 collection, and a sketch or description of all devices, formulæ and methods of accomplishing objects pertaining to the gas business, is respectfully solicited.

Please send a written explanation, accompanied by any sketch, photograph or drawing, to the above address, or a description alone will suffice.

Hoping to receive prompt compliance,

Yours very truly, W. E. STEINWEDELL, Editor.

BRIEFLY TOLD.

NOTES REGARDING THE MILWAUKEE MEETING OF THE AMERICAN GAS LIGHT ASSOCIATION.—The meeting of the American Gas Light Association in October at Milwaukee promises to be an unusually good and profitable one. While the officers and committee are doing all possible to make it an exceptionally pleasant and profitable meeting it needs the co-operation of the members to make it a pronounced success and it should have among other things a large body of new members to add to its present list. This is a work peculiarly in the hands of the members themselves and depends upon the extent and earnestness of the effort on their part as to its results. Do a little missionary work on this line. What is needed is a persuasive hustle. A fine list of papers is being prepared and there will be sufficient of interest to repay any who make the journey. Every indication points to a good attendance and an exceptionally good meeting. It only needs the hearty co-operation of the members to make this the largest and best meeting we have ever held.

LIBRARY OF CONGRESS. AUG. 7 SMITHSONIAN DEPOSIT.

KNOWLEDGE BY CONTACT.—When a gas superintendent has reached the point where he thinks he is doing his best with his conditions and equipment he begins revolving in his mind how best to improve them. He has mastered the kinks of his different machines, but in the majority of cases he has gone no further; the need not being great, his time is devoted to getting and keeping business. If he does not find the time to visit the plants of his associates in business to learn the method of operation and efficiency of apparatus in their works he is apt to make his extensions along the lines to which he has been accustomed whether it is good or bad practice except some persuasive constructor wins him to a special design. The courtesy of gas men not in competition with each other is proverbial in the profession, and these heart to heart talks in a smoke filled retort house, or ammonia smelling condensing room, or sulphurous purifier house, where ocular demonstrations of the workings or failure to work of a charging machine, a washer or a purifier carriage, is an investment of time which the ambitious superintendent cannot afford to forego, and which enables him to render his company invaluable service in the selection of new machinery or improvements to old. The enormous advantage of this "personal contact" with others in the same business with the machinery before you cannot be too highly estimated, and their visits should not be spasmodic; but a little systematic investigation made before hand as to what may be seen in the line in which you are most interested. Dates should be fixed and the appointment kept like any other business appointment. Many hundreds of thousands of dollars are spent yearly on the say so of friendly advisers in the profession, or on the persuasive ability of the commercial representative, both of which should have your attention, but for your own satisfaction, yours and the company's benefit, visit as many plants as there are different designs of one kind of apparatus, in fact visit more, for it is not infrequently found that through misunderstanding of directions for operation, poor materials and other local conditions, a well designed machine is abused. The cost to the gas company of such visits on such occasions is nothing compared to the improper expenditure of the company's money. It is often necessary to educate directors along this line. Then they should be educated in the same manner that consumers are. It is working for their interest. One should not wait to obtain knowledge until the necessity arises. Anticipate it, and make "personal contact" visits systematically.

NOTES—

THE Edison Electric Company, of Los Angeles, Cal., has purchased from a man named Morton the gas franchise obtained by him some months ago.

NEWS from Irwin, Pa., states that the artificial gas plant, erected 3 years ago near the Penn Shaft, is being dismantled. The competition from the natural gas companies gave it its quietus before it was finished. The Company has been a heavy loser here, as over $50,000 was invested in the plant. It will now be taken to West Virginia.

THE Valparaiso (Ind.) Light and Fuel Company sold its gas and electric light plant to Charles H. Geist, of Chicago. The consideration is said to be $60,000.

THE Burn-Peterit Manufacturing Company, with a capital of $300,000 paid in, located at New Haven, Conn., will make gas and electric lighting fixtures. This concern will occupy a portion of the plant already taken by the W. S. Burn Company in Fair Haven.

JOHN OTTO, the new Santa Barbara Manager of the Edison Electric Light Company, announces that that Company will soon construct a new gas plant near the Company's car barn. The change is necessary in order to increase the capacity of the plant and to remove the business from its present residential site.

NEWS comes from Austin, Tex., that a 25-year franchise has been granted by the city council to parties who are prepared to install a gas plant in that city. The parties interested are Mr. T. J. Leckband, of Mason city, Ia., and Messrs. Gates and Howie, of Brooklyn, Ia.

THE Bellows Falls and North Walpole Gas Company has filed articles of incorporation in the office of the Secretary of State. The capital stock is $50,000, and the Company will furnish light and power for Bellows Falls, Vt., and North Walpole, N. H.

MANTON, R. I., will have gas supplied from Providence.

THE Needham (Mass.) Gas Company has been granted a franchise by the Selectmen. James F. Shaw, of Manchester; G. Edwin Alden, Vincent and Bertram S. Goldthwaite, of Wellesley, and B. Nason Hamlin, T. Fred. Peabody, Levi Ladd, F. De M. Dunn, E. G. Pond and John Moseley, of Needham, are the incorporators of the Company. The capital stock of the Company is $20,000, divided into 200 shares of $100 each. The Newton and Watertown Gas Light Company are no doubt in a position to furnish gas to Needham at a much less expense than this new Company could possibly do it for.

THE Springfield (Mass.) Gas Company will build a 2,000,000 cubic foot holder.

[OFFICIAL REPORT.—REVISED BY THE SECRETARY.—CONTINUED FROM PAGE 168.]

TWENTY-EIGHTH ANNUAL MEETING, WESTERN GAS ASSOCIATION.

HELD AT CHICAGO, ILLS., IN THE AUDITORIUM HOTEL, MAY 17, 18 AND 19.

SECOND DAY—AFTERNOON SESSION.

ELECTION OF OFFICERS.

The President—Gentlemen, the next office to be filled is that of First Vice-President. Nominations are now in order.

Mr. McIlhenny—Mr. President, I nominate Mr. K. M. Mitchell for the office of First Vice-President. (Seconded.)

The President—The nomination of Mr. K. M. Mitchell has been made. Any further nominations?

Mr. Steinwedell—I move that the nominations be closed, and that the Secretary be authorized to cast the ballot of the Association for Mr. Mitchell. (The motion was seconded.)

The President—It has been moved and seconded that the nomination be made unanimous, and that the Secretary cast the ballot of the Association for Mr. K. M. Mitchell as First Vice-President. (The motion was adopted.)

The Secretary—Mr. President, I cast the unanimous vote of the members present for Mr. K. M. Mitchell, to serve as First Vice-President of the Western Gas Association for the ensuing year.

Mr. Mitchell—Gentlemen, I am not a public speaker, but I want to thank you for this great honor, and I promise you that I will do the very best I can for the interests of our beloved Association. I thank you.

The President—The next office to be filled is that of Second Vice President.

Mr. Steinwedell—I would like to nominate Mr. D. R. Warmington, of Cleveland.

The President—Mr. Warmington is placed in nomination.

Mr. Lynn—I would nominate Mr. W. A. Baehr, of St. Louis.

The President—Mr. Baehr is placed in nomination. Any further nominations? It has been moved that the nominations be closed, (The motion was seconded and adopted.) Nominations are closed. As long as two names are in nomination it will be necessary to cast a ballot and appoint tellers. I appoint Mr. Wm. McDonald and Mr. Butterworth as tellers. Gentlemen, the question has been asked if associate members have the right to vote for officers. By reference to the by-laws you will find that associate members have all the rights of active members, except the right to hold office. Associate members can vote. (A ballot was taken.)

Mr. McIlhenny—Can't we proceed with the next order of business while the ballots are being counted?

The President—I imagine so; yes. The next officer to be elected is the Secretary. Nominations for Secretary are now in order.

Mr. Donald McDonald—I nominate Mr. Dunbar.

Mr. McIlhenny—I second the nomination of Mr. Dunbar.

The President—Mr. Dunbar has been nominated for Secretary for the ensuing year.

Mr. McIlhenny—I move that nominations close and that the President cast the ballot of the Association for Mr. Dunbar as Secretary.

The President—You have heard the motion, gentlemen, that the nominations be closed, and that the President cast the ballot of the Association for Mr. Dunbar as Secretary. (The motion was adopted.) I take great pleasuae in casting the vote of this Association unanimously for Mr. Dunbar as Secretary for the ensuing year. Before announcing the result of the vote for Vice-President I think we had better hear from our newly elected Secretary.

The Secretary—Mr. President and Gentlemen: The greatest portion allotted to us in life is strenuousness in the faithful performance of duty and in the fulfilment of our obligations. Recreation is only beneficial as it enables us with renewed energy and vigor to re-enter upon the performance of our duty in life. Especially fortunate is he who has for his superiors those with whom duty becomes a pleasure. I assure the members of the Western Gas Association that such has been our relation that my serving you in the past years has been to me a great pleasure, and I am sure that in the forthcoming year it will be an equally pleasant task. Gentlemen, I thank you for this expression of your goodwill, and trust that I may fulfil every obligation expected of me. (Applause.)

Mr. McDonald—The following is the result of the ballot: William A. Baehr has 59, D. R. Warmington, 32.

The President—Gentlemen, Mr. Baehr is elected Second Vice-Presi-

dent of this Association for the ensuing year. Mr. Baehr, let us hear from you.

Mr. Baehr—Well, Mr. President, it seems I have to. Gentlemen, I will make the speech very short, because I might be accused of advertising St. Louis. I thank you.

Mr. McIlhenny—We cannot say what is the matter with the State of Missouri, as all three of our officers are now from that State.

Mr. Doty—You will have to show me.

The President—The next office to be filled is that of Editor of the Wrinkle Department. Nominations are now in order.

Mr. Mitchell—I nominate Mr. Baehr.

Mr. Doty—I nominate Mr. McAdam, of Milwankee.

The President—Mr. McAdam is placed in nomination.

Mr. Baehr—I wish to nominate Mr. McAdam.

The President—Mr. McAdam is nominated again. If there are no further nominations we will proceed to ballot for the Editor of the Wrinkle Department. Two names are in nomination, those of Mr. Baehr and Mr. McAdam.

Mr. McDonald—Are we continuous tellers?

The President—Yes; you are appointed indefinitely. While the tellers are counting the votes for the Editor of the Wrinkle Department, nominations for four Directors are in order.

Mr Doty—Really five.

The President—There will be nominations for five Directors; one to take the place of Mr. Baehr, who has been promoted, one for one year and four for two years.

Mr. Baehr—Mr. President, I wish to nominate a very able gentleman, who will undoubtedly do good work for the Association, Mr. Fred. Wheeler.

Mr. Doty—I would like to nominate Mr. Berkley, of Bloomington, Ills. Mr. Berkley has given evidence of his zeal for the welfare of the Association by his address to us this afternoon. I would also like to nominate Mr. J. H. Eustace of Chicago; Mr. E. E. Witherby, of New York; Mr. Charles H. Dickey, of Baltimore.

Mr. Ramsdell—I would like to nominate Mr. George Clarke, of Kansas City.

Mr. Howard—I nominate Mr. John D. McIlhenny.

Mr. McIlhenny—I respectfully decline. I have served for the past two years, and I believe in rotation in office, so I respectfully ask that my name be removed. I am very much obliged to you.

Mr. Ramsdell—I move that the nominations be closed.

Mr. George Clarke—I nominate Henry L. Doherty.

Mr. Steinwedell—I move that the nominations be closed. (The motion was seconded and adopted.)

The President—The nominees for Directors of this Association are Mr. F. B. Wheeler, Mr. Joseph Berkley, Mr. J. H. Eustace, Mr. E. E. Whitherby, Mr. Charles H. Dickey, Mr. George Clarke and Mr. H. L. Doherty. As we have one Director to elect for the short term, some arrangement had better be made in advance for division.

Mr. Doty—The lowest man.

The Secretary—I would suggeet that the four receiving the largest number of votes be selected to serve for two years, and the person receiving the fifth largest number of votes be selected to serve for the short term. (The motion was seconded and adopted and a ballot was taken.)

Mr. McDonald—I will announce the result of the ballot for Editor of the Wrinkle Department, as follows: Mr. McAdam, 48; Mr. Baehr, 31. For Directors: Mr. Eustace, 57; Mr. Dickey, 53; Mr. Wheeler, 50; Mr. Clarke, 47; Mr. Witherby, 42; Mr. Berkley, 36; Mr. Doherty, 31.

The President—Gentlemen, according to the result of the ballot, Mr. McAdam is elected Editor of the Wrinkle Department for the ensuing year. Messrs. Eustace, Dickey, Wheeler and Clarke are elected Directors for the long term and Mr. Witherby a Director for the short term.

The Secretary—Mr. President, it has been the custom in the Western Gas Association at the annual meeting of the Board of Directors for the past Presidents to meet with them. I believe that their experience and advice is valuable at the annual meetings of the Board of Directors. I therefore move that an additional section be made to our by-laws, making past Presidents of our Association *ex officio* members of the Board of Directors. (The motion was seconded.)

The President—Gentlemen, you have heard the motion, which has been duly seconded, that Past Presidents of this Association be made *ex officio* members of the Board of Directors. Mr. Secretary, that will require an amendment, will it not? (The motion was adopted.) There being no further business before the Association, we will stand adjourned until to-morrow morning at 10 o'clock.

THIRD DAY, MORNING SESSION.

The Convention reassembled on Friday, at 10:15 A.M., President Thwing presiding.

The President—Is the Committee on President's Address ready to report?

Mr. Pratt—Mr. President, in making this report gentlemen will notice that the Committee has refrained from saying all the good things it could say concerning the President's Address, but has simply paid attention to the recommendations made.

REPORT OF COMMITTEE ON PRESIDENT'S ADDRESS.

The Western Gas Association—Gentlemen: Your Committee to which the President's Address was referred begs to report as follows: Taking up the recommendations of the President in the order in which they are mentioned, your Committee does not agree with the opinion of the President that a central organization for directing the work of the existing Associations is more desirable than a merger of the Associations into one body; but does think that such central supervision of the work is better than the present system of disjointed working, and that in case the merger cannot be accomplished promptly such an organization would be of advantage and would probably pave the way to an ultimate merger. Your Committee does not consider that such a merger would annihilate or overthrow the older Associations, but would lead them into paths of greater usefulness.

Your Committee agrees with the President that a large part of the value of gas associations lies in the opportunities for personal interchange of thought, experiences and opinions afforded by the meetings, and thinks that this opportunity would be enlarged, and not restricted, by the merging of the existing Associations into one body. As has been stated by a prominent member of the gas fraternity, "With one Association it would be possible to secure such interchange with all other gas men, by attending one meeting only, while at present it is necessary to attend all the meetings to attain this end."

Regarding the recommendation for the formation of a gas institute, it will be seen from what has been said before that your Committee favors a plan of this kind only as a second choice and does not think it well to proceed along the lines of a gas institute until there has been some definite outcome of the work of the Committee now considering the question of the amalgamation of the existing Associations.

Regarding the proposal of the Ohio Gas Light Association, your Committee feels, in view of its importance, that it be left to the deliberations of this Association.

Your Committee wishes to call especial attention to the President's remarks regarding municipal ownership, and recommends the appointment of a special committee of three by the President to investigate the best method of presenting the gas company's side of this question and the protection of their interests. Your Committee further believes that the formation of State Gas Associations will materially assist in bringing about better and more complete dissemination of information on this subject.

The Association is to be congratulated upon its exhibition in St. Louis last year, and its thanks are due to the members and others outside of the Association, who by their efforts secured its success.

All of the above is respectfully submitted by the Committee.

EDWARD G. PRATT,
ALFRED E. FORSTALL,
WM. E. STEINWEDEEL,
} Committee.

Mr. Donald McDonald—Has the report been acted upon?

The President—I was just about to present the report to the Association.

Mr. Pratt—I move the adoption of the report. (The motion was seconded.)

The President—It is moved and seconded that the report be adopted.

Mr. Donald McDonald—I wish to say, on the part of the Ohio Gas Light Association, that the invitation which it extended to this Association had nothing behind it except goodwill for this Association as a body and friendship towards its members individually. The Ohio has no ulterior designs either on your persons or on your pocketbooks. The Ohio passed unanimously the resolution looking towards a joint meeting. You have no doubt all read it. I transmitted it to the officers of this Association in as courteous a letter as I knew how to write. The Committee on Next Place of Meeting has made its report; that report has been adopted, and I presume the matter is, therefore, finally disposed of. It is, of course, true that any gentleman or body of gentlemen has the same right to decline an invitation that another has to issue one. The custom is that if it is declined it should be declined politely. If the Western is satisfied with the disposition that has been made of

this matter, I assure you that the Ohio is not offended. On the contrary, on behalf of the Ohio, I wish to invite every member of this Association to meet with us at Cincinnati next spring as our honored guests. Cincinnati is a town that has a great deal to show of interest to gas men. If by that time Ohio has taken a name more in keeping with the national character of its membership and its aims, I want you to know that the invitation still holds good, and that you will meet with a hearty welcome. Now, gentlemen, as a member of the Western Gas Association, I want to indorse heartily all that this Committee has said in behalf of a single national association. Our efficiency should be equal to the sum of our combined powers, and not the difference, as it now is. There is not one of us that would tolerate in any enterprise which we controlled the waste of energy and the duplication of work which goes on every year in the gas industry in America owing to the present multiple system of associations. The State associations and the district associations have their proper place to fill—there are not too many of them; there ought to be more of them—but there ought to be one, and only one, national association. It should include in its ranks every man in the gas business that is worth knowing, and its work and its literature should cover every fact of any importance in the gas industry as it exists and is developed in America. Now, gentlemen, I have been told that this movement is premature, and by many others that it is impossible. Perhaps it is, but I don't believe it. The action which the Western has taken on the invitation of the Ohio is, to say the least of it, discouraging; but, if I can borrow the words of the Scotch poet, I want to say that I hope and believe that—

For a' that and a' that,
It's coming yet for a' that,
When gas men the country o'er
Shall brithers be for a' that. (Applause.)

The President—I think it is hardly necessary to say that the latch string of the Western Association is always out, and that brother gas men of any association, or of no association, are welcome to all of our meetings and will be treated cordially and fraternally. If they want to become members of the Western we are glad to receive them; if they don't wish to become members they are just as welcome as though they were members of the Association. So a definite and special invitation to members of the Ohio Association or any other Association to attend the meeting of the Western is not necessary. (The motion was adopted.) The report of the Committee embraces the appointment of a Committee on Publicity; I believe that would be the better word for it. That Committee will be appointed later.

Mr. McDonald—I beg to report two additional members: Mr. F. C. Duncan, Galesburg, Ind., the Auditor and Treasurer of the Gas Company, to active membership; Mr. David Davis, of Litchfield, Ills., Secretary of the Litchfield Gas and Electric Company. That makes a total of 129 members that have been received by the Association at its present meeting. I move, Mr. Chairman; that the Secretary cast a ballot for these two gentlemen. (The motion was seconded and adopted.)

The Secretary—I cast the unanimous vote of the members of the Western Gas Association assembled for David Davis, of Litchfield, Ills., as an active member, and F. C. Duncan, Galesburg, Ind., also as an active member of this Association.

The President—While it is not an order of business and is not included in the recommendations of the President's Address, it seems to me to be proper that a report should be made from this committee on the merger of gas associations, reporting progress or giving us some idea as to what is being done. I believe Mr. Doty is chairman as representing the Western Association.

Mr. Doty—What have you got before you now?

The President—The report of the Committee on President's Address.

Mr. Doty—I did not hear it.

The President—This has nothing to do with it at all, but we would like to have a report from our representatives to the committee appointed by the Gas Congress.

Mr. Doty—The President has requested that I report upon the matter that was brought up at the meeting last year at St. Louis, largely the question of better association work and how to accomplish better association work. As a result of a motion which was introduced at the meeting, the different gas associations throughout the United States, our own included, appointed members of a committee that were to consider this question of better association work. This committee, consisting of representatives of the American Gas Light Association, the Western Gas Association, the Ohio Gas Light Association, the Pacific Coast Association, the New England Association, the Society of Gas Lighting, the Wisconsin Association and the Michigan Association, met in New York early in February. If I remember correctly, there were about 20 representative gas men present at this meeting. The discussion brought about a unanimous opinion that in order to accomplish better association work there should be presented some plan for closer affiliation, with the object in view of directing the work along better channels, harmonious work, avoiding working in parallel, so that there would be no overlapping. A vote was taken, and it was practically unanimous—I may say unanimous—that the sentiment was that there should be a better co-ordination, and a special committee of six was appointed to draft plans or prepare a report showing ways and means to bring about the accomplishment of the unanimous opinion of the men who were present. That sub-committee was to report back to the general committee, and if the plan received the approval of the general committee it was to be submitted to the Associations. I am not a member of that sub-committee, and, of course, I cannot speak for its work. I can simply say that as one of the general committee I have not yet received any notice of a plan to accomplish the object we had in mind. The sentiment which influenced all of the members of the general committee was to do something to advance the gas industry. The thought which was in my mind, and seemed to be in most of the men's minds there, was that at that meeting we could afford to sink our individuality as association men and stand out as gas men. Figures were presented showing the lamentable lack of financial support in carrying on the work that is possible, that should be done, to advance the gas industry. I think it was stated that the total revenues from all of the gas associations to-day, the small sum that they have at their command to carry on the work of investigation, is only about $12,000 a year. Figures were presented showing the revenues of associations in allied industries. For instance, the Mechanical Engineers, the revenue is nearly $40,000 a year; Civil Engineers, the revenue is in excess of $40,000 a year; the Electrical Engineers have revenues in excess of $40,000 a year. Aside from these purely engineering societies, associations like the National Electric Light Association had revenues in excess of $40,000 a year. Now these associations, with the means at their hands, can do much more effective work than a number of individual associations having total revenues of only $12,000 a year. One of the plans that was suggested was company membership. This is not a new idea; in fact, the older men of the American Gas Light Association will remember that at the organization the membership was a company membership. Representatives were selected by the companies to attend the meetings, but the revenues were derived from company membership. This plan commends itself, in the fact that the dues can be raised very materially by having company membership. The larger companies, like New York, Chicago, Philadelphia, St. Louis, Boston, could pay $100, $200, $300 a year for membership privileges in the National Association. A second class of membership would be the officers of the gas companies. You and I would be members of the National Association so long as we retained our identity with the Association. In the event that we lost our identity, we would then not retain active membership, the reason being that the control of the interests of the gas industry should remain with the men who were responsible for such work. In addition to the company membership and the active membership of gas company officers, there would be other classes of members, such as the professors in colleges. We could appeal to them and get the benefit of their work and investigation, which would add very materially to our information. The fees for membership of college professors and educators would naturally be small, because they would be giving to us a great deal more than we were taking from them. The meetings in New York lasted two days and were very harmonious, as meetings of gas men should be, having a common purpose in mind. I think they were earnest and sincere in their desire to do better work and accomplish better things. As I gathered from the meeting, there was no intent to destroy the individuality of the present associations. There is need for a gas association in New England. There is need for a gas association on the Pacific Coast. There is a great need for the State associations, and the class of work to be carried on by the State associations would be naturally local. They would carry on matters that properly came within their own province, such as taxes locally and legislative matters, and controlling of the market for residuals; but as far as the general investigations were concerned, those would be outlined by the National Association, if there is to be a National Association, or a National Board of Control, if it is to be a National Board of Control, or whatever plan is adopted. The idea is not to obliterate any association; the idea is to harmonize the work of the association for the advancement of the gas industry. With that idea I am in hearty accord, and I trust that I voice the sentiment of the members of the Western Gas Association, and that as Mr. McDonald and I are the representatives, we can pledge

the Western Gas Association to continue to give its full and real support to any plan that commends itself to our judgment, having in mind only the advancement of the work of the gas industry.

The President—Gentlemen, I don't know but that it would be better to take some action in regard to this report. The committee was regularly appointed by motion.

Mr. Pratt—Inasmuch as Mr. Doty's remarks have given the members of this Association a sort of a *resumé* of the work of the committee to date, it would seem to me that some definite action would be proper at this time. I move that the remarks of Mr. Doty, as representing this Association, be made a part of the records, and if they are given by Mr. Doty as a report I move that they be received and spread upon the records.

The President—I understand, Mr. Doty, that you make this as a report.

Mr. Doty—Yes, if you desire it. (The motion that the report be received and spread upon the records was seconded and adopted.)

The President—The next order of business is Report and History of Western Gas Association's Exhibit at the World's Fair, by Mr. F. H. Shelton. Mr. Shelton being absent, Mr. Persons will read the report.

Mr. Persons—Mr. Chairman and Gentlemen, this is the final report of the Committee of the Western Association on the World's Fair Exhibit.

FINAL REPORT OF COMMITTEE ON WORLD'S FAIR EXHIBIT.

PHILADELPHIA, PA., May 15th, 1905.

To the Directors of the Western Gas Association—Gentlemen: In making final report upon the matter of World's Fair Exhibit it is unnecessary to write at length as to the causes which led to the Exhibit, or what was done, as these points are covered in report made to you a year ago at the meeting in St. Louis, in June. Since that time, the enterprise has been concluded and the remarks below are in the nature of comments upon what was done; together with a statement of costs and other matters necessary in closing the subject.

The general feeling that remains with me in looking back over the matter is that in spite of the trouble, the expense and the annoyances which necessarily accompanied such an exhibit, it was, nevertheless, well worth while, and to the continuing credit of the Western Gas Association, that stood forth and successfully put it through. The exhibit unquestionably served its specific purposes of forming a central meeting point for all gas visitors, of illustrating to gas men novelties and the best things in the business, and of showing to the public in a large measure the uses and conveniences of gas, in which we, as producers, and the public as users, are equally interested.

While it was to be regretted that our invitation to some of the other Associations to join in the movement, and thus secure a larger result, was not accepted, nor such plan carried out, and while as a result the standard for comparison or results were not as high as would otherwise have been the case, it is none the less a fact that the Exhibit was comprehensive in itself and successful and creditable, particularly when viewed as an Exhibit of one Association only, and not of the collective Associations of the United States.

In the beginning its usefulness perhaps appealed more especially to gas men who got there early in the season, and were especially interested in distinctive novelties, such as the DeBrouwer charging apparatus, inverted incandescent burners, improved meter appliances, etc., and of which these items are but a few of those shown, while in the latter part of the Exposition period its usefulness particularly turned toward that of the public interest, in view of enlargement of the display of burners, ranges, gas appliances for domestic use, etc. While it is often hard to trace the direct results and direct good which such exhibits accomplish, it is certain that both directly and indirectly much good is accomplished and the numerous instances in which reference has been made to the results of our Exhibit, fully satisfy me on this score.

It would be a pleasure to refer in detail to the co-operation almost unanimously displayed by the various exhibitors, but it is not feasible to take up each by name; even so, I cannot neglect this opportunity of pointing out that perhaps the largest measure of success was due to the particular co-operation of the Laclede Gas Light Company, the United Gas Improvement Comprny, representing gas companies without special trade interests, and the Welsbach Company, and the associated meter interests, particularly representing the trade.

The total subscriptions to the project amounted to $7,345; these came from gas companies chiefly in the Mississippi Valley, and the territory of the Western Association, and from trade interests and exhibitors, in about equal proportion. The total expenses amounted to $7,333.24, leaving a net balance of $11.76 on hand.

The above figures are after reckoning the subscription of this Association, and after paying all bills to date, of every description. There are no accounts outstanding. It is almost unnecessary to state, in this connection, but yet it is perhaps well to state so that it may be a matter of absolute record, as it is of fact, that all of the disbursements were made with close scrutiny, and with thorough fidelity in the expenditure of the collected funds: there were no extravagances, no salaries outside of the Representative in Charge and the helper, and no direction in which it might be urged that unnecessary expenses or personal comforts were paid out of the subscribed money.

The only outstanding point of any nature that is not disposed of is the following: In the beginning, it was promised that certain medals would be awarded those who exhibited and subscribed, and otherwise assisted the enterprise, as a recognition of their co-operation, and a pleasant souvenir. Later, upon a canvass being taken, it was found that the recipients to be preferred a certificate appropriate to the occasion, rather than a medal, as more easily framed or displayed. It has been the intention to distribute such certificates, but as the matter stands, the funds have been practically completely used in the construction, maintenance and dismantling. There is now no money available for this purpose. It is likely that by further canvass a little additional money could be collected, which would defray this expense, if it is still felt to be desirable. To a certain extent the Association is obligated, through its Committee, to distribute these certificates; on the other hand, it might be that there being no funds, and a further canvass not being very desirable, the properly engrossed formal thanks of the Directors and of the members of the Association by suitable resolution would be accepted and be sufficient to those who may be yet expecting the certificates in question. In such event a suitable resolution, passed at this meeting could be quickly printed, in display type on heavy card to be signed by the Association officers and promptly distributed at almost no expense. I would like instructions on this point.

Mr. F. R. Persons, the representative in charge during the 7 months' period, as well as for 2 months thereafter, in the dismantling time, is entitled to the thanks and appreciation of the Association for his services and work extended in the Association's interest. He has made a short report from his point of view, and on the ground, which is herewith attached.

The detailed statement of all the moneys collected, and the itemized bills showing all disbursements, are completed and will be forwarded to the Secretary for file with the Association archives, and they will be open to the inspection of anyone interested.

I would suggest that the Committee be now discharged, the subject being virtually concluded. Respectfully, F. H. SHELTON,
Committee on Exhibit, St. Louis Exposition.

ST. LOUIS, MO., Dec. 30, 1904.

Mr. F. H. Shelton, Chairman, Philadelphia, Pa.—My dear Sir: The space in the Palace of Liberal Arts at the World's Fair that has been known as the "Gas Place" is no more. The exhibits have all been packed and shipped. We have tried to make the public understand that the gas industry is not a thing of the past, but a very live factor in the to-day and everyday commercial life. One cannot judge the benefits of the exhibition from a commercial standpoint, as we offered nothing for sale. The many inquiries made and interest taken in our exhibit by the general public lead the writer to believe that great good will result to every company connected with the gas business. The gas industry was represented by a very few people at the World's Fair, but those that were there managed to keep well to the front in the business societies and social functions incident to such a fair. The several gas men who served on the international jury were made chairman of the group juries on which they served. We were represented on the superior jury by Mr. E. G. Cowdery, of St. Louis. Perhaps the most important work completed was the proper classification of the various departments of the gas industry. The classifications that heretofore existed made no provision for anything connected with gas. To give an instance, "Gas burners" come under the head of "Lights not electric." This brought burners of all kinds in the same class as "Candles, Chinese lanterns," etc. The new classification places each department of the gas business under a proper heading, and future exhibitions will adopt the same. This work was accomplished through the efforts of group jury No. 48 assisted and aided by Mr. M. H. Hulbert, chief of the manufacturers and varied industry buildings. When the next exposition is held in this country the gas fraternity will be in line to take a proper place and have a separate

building, where every branch of the industry can have an opportunity to properly display. The benefits of the exhibit will be lasting and far reaching. Personally I want to thank our exhibitors and contributors. During the entire time of the Fair I can remember of no unpleasant incident in connections with any exhibitor. Whatever the occasion I tried to do what in my judgment was best for the interests of the fraternity at large and that which would bring it most prominently before the public.

Thanking you personally for the appointment as representative of the Western Gas Association at the greatest of all World's Fairs, I remain,

Yours very truly, FRED. R. PERSONS.

REPORT OF COMMITTEE ON WORLD'S FAIR.

June 13th, 1904.

To the Directors of the Western Gas Association—Gentlemen: At the meeting in Indianapolis last year, you will remember that the suggestion was made that it would be appropriate for this Association, the principal body of gas men in the central portion of our country, to take some part in the Louisiana Purchase Exposition, particularly in the way of providing a headquarters for gas men visiting St. Louis this year, and possibly in the way of some exhibit. A discussion of the subject resulted in the matter being put bodily in my hands, as President, with power to act. I have the honor of reporting herewith in the matter.

Upon giving it careful thought, and after consulting numerous members of the Association, it seemed feasible and desirable that the Association make a technical exhibit of the gas industry, with the idea of such display forming as well headquarters for visiting gas men. It did not seem wise to undertake to make a full display of all gas goods, or a "trade exhibit," it being felt that that was beyond the province of an organization composed chiefly of gas engineers and managers, and that any such line of trade goods should be for the manufacturers to arrange if they saw fit. On such lines, then, I went ahead.

It was manifestly impossible to have an individual building, the great expense involved, beyond our practical resources, being the chief reason. Application was, therefore, made for space in one of the regular buildings, and Section 33-A was allotted in the Liberal Arts Building. The amount procurable was very much less than desired, but the best that could be done. Invitations were shortly after sent out to certain gas companies and to practically all supply firms and people, to participate first (whether contributing or not) by loaning models, appliances and historical things suitable for exhibit, and second, for voluntary cash contributions as well, to create a fund to cover the expense. While all gas supply people, wherever located, selling to our membership, were invited to contribute, the invitations to gas companies were in the main confined to Western Gas Association members or to companies between the Alleghenies and the Rockies, the general territory of the Western Gas Association, it being the desire to have the matter, as far as gas companies were concerned, an affair primarily of the Western companies.

The results of this invitation to participate were of interest, yet disappointing. As in many such affairs, while favoring the undertaking in theory, the majority of those solicited did not practically assist by participating. It is doubtless another instance of the belief that some other fellow would do enough, and the failure to realize the need of everyone joining in to make it the fullest success. And as a net result, out of 243 gas companies interrogated but 45 subscribed. Of about 125 trade interests about 52 subscribed. Our exhibit then is in reality, as far as the "sinews" are concerned, and co-operation, the work of about 97.

All honor, I say, to them; to those appreciative, broad-minded and practically helpful; to those loyal to the gas business, doing each a share towards a praiseworthy and desirable object. Honor to a number of small companies, such as far off Tampa, Fla., that sent contributions to help push the enterprise along, and to up-state companies, that in proportion to their means, in many cases, contributed more than some of the so-called big companies. And honor too, to those trade interests that turned to, and (without appreciable thought of especial advertising result, or advantage) without exception, almost, did all within the power of each, to promote the success of our exhibit.

Amongst such good spirit of those participating, it is perhaps invidious to comment upon any individuality, yet it seems to me but just to say in particular that the meter interests have co-operated with the Association to make our exhibit a success; and in particular has the U. G. I. Company gone to large expense to lend us many and most attractive exhibits. As to the cost of the exhibit, I would report that owing to unexpected rates for piping, plumbing, carpenter work, painting, etc, imposed by those who controlled such work in the Exposition, rates three times usual costs and naturally not anticipated, but which could not be avoided, the cost has been in excess of the estimates. And the amount of money that it was thought would be subscribed, has, in fact, fallen short. These two reasons leave us at present with a deficit and some money yet to be raised to maintain and terminate the Exhibit, and it is hoped that in one way or another we will be able to secure the necessary funds. Under the circumstances, any gas companies or trade interests, who have not heretofore subscribed something and who may wish to help and show their appreciation of the Western Exhibit enterprise, will find any subscription warmly appreciated.

A detailed report of the money collected and the expenditures is on file. In the matter there have been a few shadows. Some have chafed that they did not have more space, or better location, or something they have not. To these I can only answer that we have had to get along at best with far less space than desired. The space in the Liberal Arts building was over-applied for. We have but half what we asked for, and even that was in peril of being cut down at one time. We could have easily filled four times the space we have. As a result I have had to manoeuver beyond measure to even partially display what was available. To cap the climax it developed that our space is over the bed of an old pond, where it was not possible to get a footing for shoring, first expected, and the management of the fair prohibited adding further weight or exhibits on the ground of public safety, and some exhibits, most kindly prepared and tendered, after all could not be received, and through no fault of ours. We "have had our own troubles" and it has been impossible to make the showing desired, and where I have disappointed some, I can only say that what was finally done, I did absolutely from necessity or in sincerity of belief as to the best general result, without personal or business bias, it being well known that at any rate I am free from any trade affiliation, that would influence me.

I want to record my appreciation of the attitude of Mr. J. A. Ockerson, Chief of the Department of Liberal Arts. In many ways he has extended courtesies and facilities.

The degree of success attained and result of it all, I leave to your kind judgment. It is my own opinion that while not making a national exhibit, we have, however, made a most creditable Association exhibit. It is replete with characteristic features of our business, is dignified and instructive. Aside from the regular articles to be expected, it contains an excellent number of novelties that must be of especial interest to the watchful and progressive gas man, for instance, the DeBrouwer coal projector, inverted incandescent burners, concrete purifier work, high pressure appliances, etc.

Aside from the exhibits, members and friends will find the gas display a convenient headquarters, for meeting, inviting guests, correspondence, information and other features. The attendant in charge is, specifically, instructed to "tumble over himself" to anyone showing a Western badge, or indorsed by a Western member, and Mr. F. R. Persons, officially in charge, and representing the Association, needs no introduction.

The lighthouse that we have built and tendered to the Exposition management I trust will be of more than passing interest, and that our serious thought will cause us to realize how well it typifies the aims of the Association and the making of the whole exhibit, our aim and purpose being that of giving light, both actually and educatively.

Personally, let me say that to make this exhibit a success, to the credit of the Association, I have labored long and hard. No one can know how many hours, days and nights I have worked upon it. Without an atom of personal thought, but wholly that it would be a credit to the good, old Western, I have aimed to make it a Western success. It is now launched. After this meeting I return to the ranks, and in turning over this exhibit to the succeeding President, Mr. Thwing, who will inherit the charge until the Exposition's close, I shall be wholly satisfied if you gentlemen to perhaps a moderate degree express approval of my work. Respectfully, F. H. SHELTON, President, and Committee on Exhibits.

Mr. Persons—There is a point I would like to have the Association take up, and that is whether it is desirable to raise more money and present the certificates or take the will for the deed to a certain extent. It would probably cost $100 to put out the certificates. Or shall we let the matter drop with a suitable vote of thanks to the contributors and exhibitors?

Mr. Pratt—Is it your desire to take the report of the Committee up in the form suggested? If so, I would like to make a motion.

The President—Yes, we will take up the report in the regular way.

Mr. Pratt—Our company contributed to the work of this Committee, and it also contributed so far as exhibitors are concerned. I feel that the Association ought to be congratulated, and it ought to congratulate the Committee, inasmuch as it was able to raise sufficient money to carry on this exhibition, and was able to pay its way. We should congratulate the Committee itself that it has been able to go through the thing and have a balance of eleven dollars and some odd cents on hand. As a contributor and an exhibitor I would say let the matter of the certificates drop, and let us congratulate ourselves, as I have said, that the exhibition was a success, and that it has taken care of itself financially, not to create any further burden or work upon the Committee by asking for proposed contributions. I therefore move that, so far as that part of the report is concerned, the matter of the certificates be dropped.

Mr. Runner—I second the motion.

The President—Gentlemen, you have heard the motion. Any further remarks? (The motion was adopted.) In that line I think it would be in order to present resolutions formally thanking the exhibitors of this Association, in line with the report of the Committee. Will you take that matter up, Mr. Pratt?

Mr. Pratt—I beg your pardon.

The President—I think it would be proper to present a resolution extending the formal thanks of the Association to the exhibitors who took part in the exhibit of the Western Gas Association, in accordance with the recommendations that this Committee report. I would ask you to prepare those resolutions and present them.

Mr. Pratt—All right. I will cheerfully move that some such resolutions shall be prepared.

The President—Will you prepare a resolution and present it later?

Mr. Pratt—Yes, sir.

Mr. Doty—Mr. President, may I suggest, in addition to the suggestion you have made, to extend our formal vote of thanks to the exhibitors, that it include the contributors, so that the contributors may feel that they are recompensed by the Association formally for the financial interest that they have taken, and in addition to that, inasmuch as the Chairman of the Committee makes the recommendation, that the representative of the Western Gas Association throughout the entire exhibit be awarded a special vote of thanks. I have much pleasure in making a motion, if it is in order, and if it is not, the Secretary can get it in such shape that it will be proper, to tender to Mr. Persons, as the official representative of the Western Gas Association, a hearty vote of thanks and appreciation of his faithful, intelligent and conscientious effort for the good of the Association, and the members who were the guests of the Association, during the time of the World's Fair. (The motion of Mr. Doty was seconded and adopted.)

The President—Mr. Persons, in the name of the Association I thank you for your attention to the exhibit of the Western Gas Association.

Mr. Persons—Mr. President and Gentlemen, I thank you very much for this vote, and I assure you that the task was something that if I could have appreciated it—the 7 months were so long—I never would have dared to tackle it. To tackle affairs at the meeting, entertainment and that sort of thing, to last 2 or 3 days, is very well, but spread it over 7 months and it is a pretty long task. I want to say, in connection with the report, that the report I made to Mr. Shelton will be printed with this report. I did not read it this morning, because it is not important at all. But Mr. Guldlin will take up the question of classification, which is perhaps the most important that occurred at the Fair. I thank you, gentlemen.

Mr. Pratt subsequently prepared the following resolution:

Resolved, That the thanks of this Association are due to exhibitors who participated in making the exhibit of gas apparatus and appliances at St. Louis during the period of the World's Fair in the year 1904 such a success; also to the companies and individuals who contributed to the fund for the preparation and support of this exhibition.

The President—I will appoint as a committee on public information for the protection of gas interests, as recommended by the Committee on President's Address, Mr. James W. Dunbar, Mr. Fred. B. Wheeler, and Mr. J. C. D. Clark. We will now listen to a paper by Mr. George C. Hicks, Jr., on the

ROTARY BLOWER AND EXHAUSTER: ITS CONSTRUCTION, EFFICIENCY AND APPLICATION.

In printing this paper unfortunately two of the cuts were mislaid, and Mr. Dunbar was obliged to get them up afterwards. We will distribute them.

In the early part of the 17th century, a man named Serviere, designed a rotary pump having 6 lobes similar to the teeth of a gear. This design is closer to the present type of machine than any other of the early efforts in rotary construction. During the 18th and first half of the 19th century, various forms of rotary pumps and engines were designed, quite a number of which were on the 2 and 3-lobe type, some of the intercepting blade type, such as the old Baker machine and some of the sliding vane type, such as the Makenzie.

I shall confine my paper to a rotary blower in which the impellers are symmetrical about two axes at right angles to each other, and alike one to the other, the lobe of one passing through the throat or waist of the other. I find that in rotary machines the pump and engine antedated the blower, for the blower seems to have been an offshoot of the other line of development.

In fact the Roots blower was itself directly responsible to an attempt to build a water motor by the Roots Brothers, who at that time owned and operated a woolen mill. This motor was intended to operate their mill, but being constructed of wood it naturally swelled on being put to use. It was taken to the shop, the right places relieved and then belted to a line shaft for test as to its running qualities. A foundryman standing close by noticed the current of air delivered by the machine, and induced the Roots brothers to build him one for foundry purposes. It proved a succees and was the foundation of the rotary blower and exhauster business of to-day, for with one or two exceptions, the characteristics of the original Roots blower have been adopted as the best and simplest form of rotary machine to date. These characteristics are two impellers of identical form and symmetrical about two axes at right angles. The development has been very gradual and the changes those of mechanical detail and shop convenience, and as improved machinery capable of more accurate work was placed on the market, slight changes in impeller forms have been made to take advantage of the chance to improve the efficiency by closer machine work. From a machine giving fair efficiency at a pressure of one pound, we now have one that at three and four pounds shows an efficiency equal to the best design of blowing engine and at a much less cost.

General Design.—The general design of rotary blowers is much the same, different manufacturers differing mainly, 1st, form of impeller; 2d, manner of mounting impeller on shaft: 3d, design of bearing.

The machines are made either horizontal or vertical, a horizontal machine being one that has the inlet at the bottom and the outlet at the top, or the reverse. A verticle machine, the inlet and outlet at the side. The vertical type has some advantage for connecting piping, but the horizontal machine is stiffer, and capable of running at higher speeds, which give better efficiency, as will be shown later. Either gears at one end or gears at both ends may be used. Single gears for pressures up to one pound when used without outboard bearings, and up to 10 or 12 pounds when supplied with double outboard bearings. Double gears are used over the entire range of pressures, and the choice is generally determined by the type and class of machine driving the blower.

Bearings for light pressures usually have only an up and down adjustment, but for machines from two pounds up the quarter box is preferable as additional strains have to be cared for that do not exist in the low pressure machines in sufficient force to demand protection from them.

Self oiling is almost universal on all styles of rotary blowers, and may be either by chain or ring. Both find their advocates, but I believe the final result will be in favor of the ring, though there is little to be said against either method. The machines are generally made up from 8 to 12 parts, as follows:

The head plates carrying the bearings.
Two half circles in which the impellers revolve.
Two impellers and shafts.
Two or four gears and gear cases for same.
Two pipe plates, discharge and suction.
One bedplate for direct connection to engine or motor.

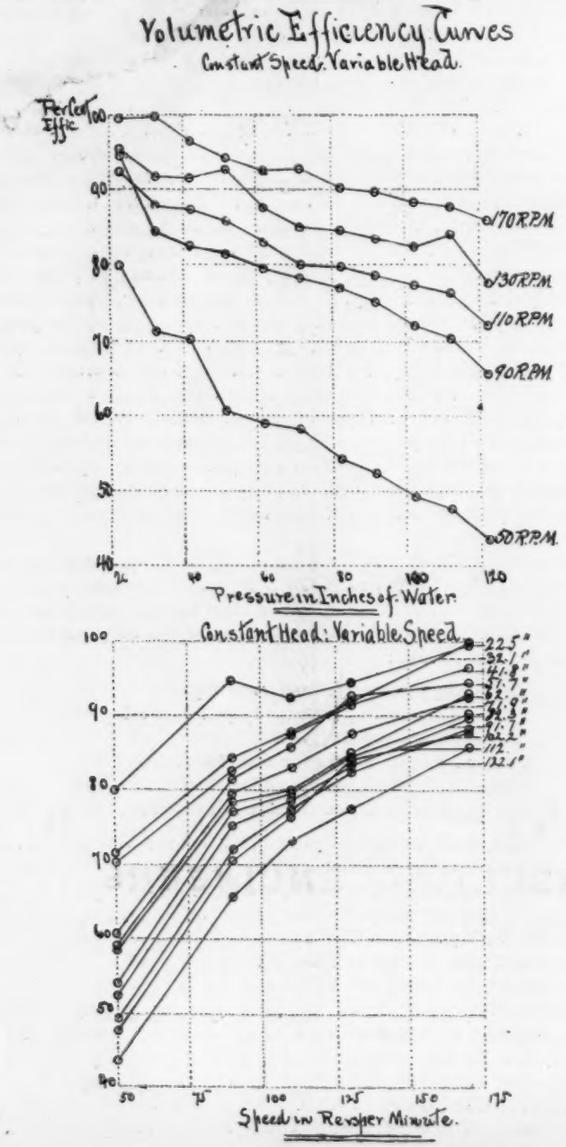
The design of the individual parts must be such that there shall be no deflection in any part of the machine. The theory and construction both demand stiffness. The head plate must be so ribbed as not to bulge out under the pressure of the gas or air, or give at the bearings under the shaft pressure. The half circles must also be rigid under pressure and stiff enough to resist any tendency of the head plates to spring them. As head plate clearances are as low as .006 and case clearances as low as .01, it will readily be seen that to keep a machine from pounding, the key note of construction must be rigidity. So also the impellers, besides having a good shaft bearing at each end, must be ribbed inside and for pressures over 1 pound, supported by a longitudinal wall running from one shaft bearing to the other, forming virtually a box girder. This construction is absolutely necessary, for no matter

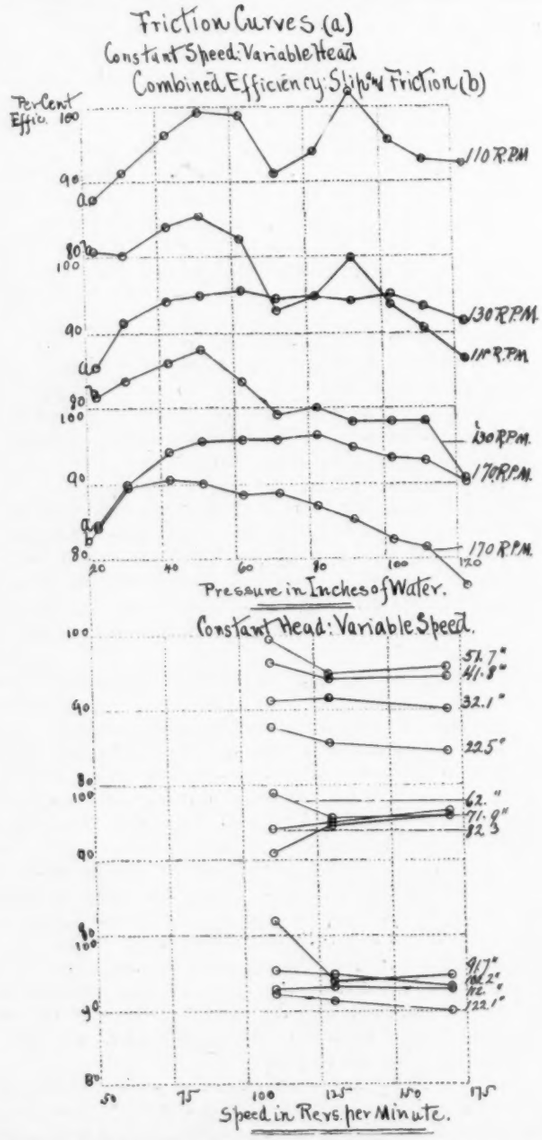
how stiff the case, if the impellers themselves spring, the machine would soon give trouble. The shaft also should not give under the load.

The proper relative position of the impellers being due to the accuracy of the gear cutting and setting, great care is necssary to have the gear square on the shaft, keyed or clamped without distortion, and teeth cut so there shall be no irregularity. Two teeth should always be in contact. If more than two teeth are in contact, it means a finer pitch, which has a tendency to weaken the tooth. If less than two, there is a chance for back lash to take place. The width of face of gears on blowers is generally about three times that necessary for driving strength, and is proportioned for wear, so that the adjustment of the impeller positions shall be necessary at long intervals only.

Impeller Curves.—In taking up the subject of impeller curves, I want first to disabuse your minds of the idea that they have any necessary relation to the curves used in gear teeth. The object of the two is radically different, for gear teeth are for the purpose of transmitting power, while the last thing the blower manufacturer or owner desires to do is to transmit power from one impeller to the other.

The choice of a particular curve should be based on: 1st, the simplicity and accuracy with which it is laid out; 2d, ease of reproduction in shop; 3d, the amount of metal left at the waist of the impeller. Reason one insures accurate templets, which are absolutely necessary for good work, and reason two insures accurate reproduction in the shop, for the less complex and more free from sudden changes of curvature, the easier the impeller is to machine, and consequently the greater uniformity of the clearance between the two impellers when operated. Reason three covers structural strength and is subservient to the others, but is still a point to be considered in design.

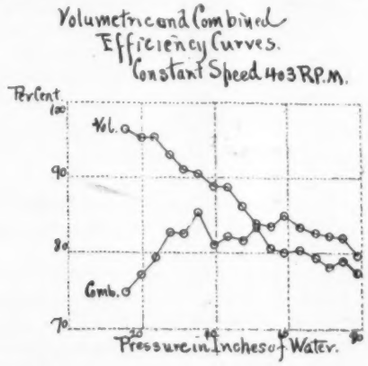




The curve used for the impeller does not affect the leakage of air or gas at either the headplates or case circle. This leaves, therefore, only the rolling together of the impellers at the center line to be considered. In gas exhausters handling foul gas, a sharp edge must be left at the extreme outer point of the impeller curve in order that the rotation of the impeller may scrape away the accumulation of tar on the case circle. This sharp edge necessitates in turn a break in the curve, which forms a clearance pocket and carries back into the suction a small amount of gas. As foul gas is mostly handled under low pressures, this loss is very small. For high pressures, it would increase as the density of the gas increases. Usually high pressure gas is clean, so that an unbroken curve may be used, avoiding this loss. If, however, there is any chance of tar or other clogging material passing through the exhauster or blower, it is safer to use the cutting edge type, even though a small loss occurs.

The closer the curve through the throat agrees with the curve of the end of the impeller passing through it, the less the slip, but too close a fit is liable to run on to another shoal, the danger of one impeller hammering the other.

Wear of the Gears.—Now, as to the wear of the gears; the shape of the curve governs the strain on the gear teeth, but only the driven impeller need be considered, for the impeller on the driving shaft does not affect the wear of the gears. If the moments or resistances be plotted on a circular base, it will be found that the resultant curve is an exact reproduction on a larger or smaller scale of the impeller curve itself. In jump contact impellers the curve becomes concentric for the angular movement taking place during the shift of contact from one side of the lobe to the other. In general, the resistance is inversely proportional to the distance of the center of the shaft to the point of



contact. Therefore, the jump contact impeller is easier on the gears than a continuous one, as the maximum and minimum are nearer together; but as an extra width of face of the gear will cover this advantage, the increased efficiency of the continuous contact type outweighs the gain in gear life due to the other type of curve. At low pressure the break contact type is most used for both gas and air, as it is cheaper to machine, and at the same time entails no appreciable loss. As stated above, an impeller having a curve that passes quickly through the waist of the other impeller answers all the gear requirements and at the same time is of the best form to retard slip.

Slip.—The slip in a rotary blower should vary as the square root of the pressure, speed being constant; and inversely as the speed, pressure constant; directly as the clearance; directly as the square root of the reciprocal of the specific gravity; directly as the square root of the ratio of the absolute temperatures.

Taking them up in order as above stated, the effect of pressure comes first. The slip varies according to the law of flow of air or gas through an orifice modified by a constant C. The opening between the case and impeller, and the impellers themselves, is long and narrow, and on the ends more like a narrow passage between two flat surfaces. As the end clearance may be made very small, this cuts very little figure, the principal source of loss being the clearance between the case and impellers and between the two impellers. In the jump contact type, such as is generally used for foul gas and low pressure, the clearance space cut away has little effect on the slip; but at high pressures, such as 5 pounds (I use the term high pressure in a relative sense only as applied to rotary blowers) this clearance modifies the curve of slip, so that the law of flow through an orifice does not apply. This can be seen in the pressure curves plotted for constant speeds. At low pressures the curve approximates closely the law, but for high pressures it is nearly a straight line. For continuous contact impellers, the law of flow through an orifice is very close to actual results.

(To be Continued.)

Sulphur in Coke and its Removal.[1]

Quite recently Professor F. Wuest, Ph.D., and Herr F. Wolff, of Aachen, have stated the results of their investigation into the question of sulphur in coke. The ultimate end they had in view was the better understanding of the effect of the sulphur introduced along with the fuel into blast furnaces; but the researches include the quantitative determination of many facts important to gas engineers. The practical value of the experiments, as applied to gas manufacture, is not restricted to an understanding of the destination of sulphur in ordinary carbonization, but reaches to the methods for improving the quality of gas coke intended for special uses. The removal of sulphur and arsenic from coke to be used in malt kilns is of pressing importance in many provincial centers, and the means for its accomplishment appear to be well indicated by the experiments here briefly described.

The coke experimented upon was from the Westphalian Ruhr district; and it contained as total sulphur 1.406 per cent., carbon 86.07 per cent., and ash 10.05 per cent. The composition of the ash was as follows:

Bases.	Per Cent.	*Acids.*	Per Cent.
Al_2O_3	27.36	SO_3	2.292
SiO_2	38.26	P_2O_5	.500 = P .220
Fe_2O_3	21.50 = Fe 15.05		
Mn_3O_4	.61 = Mn .44		
CaO	6.13		
MgO	3.32		

1. *Journal of Gas Lighting.*

The mineral constituents of the coke with which the sulphur is chiefly associated are iron, manganese, calcium, and magnesium; and they were present in the coke as follows:

Iron	1.511 per cent.	Calcium	0.441 per cent.
Manganese	0.044 "	Magnesium	0.201 "
	1.555 per cent.		0.642 per cent.

The mean of several tests gave 0.116 per cent. as the amount of sulphide sulphur it was possible to eliminate as sulphuretted hydrogen. The quantity of sulphate sulphur was 0.0922 per cent.; thus leaving 1.198 per cent. as organic sulphur [1.406 — (0.116 + 0.0922)]. The proportion—viz., 1.198 ÷ 1.406 = 85.2 per cent. of the total as organic sulphur—agrees with the published results of Bradbury, Muck, and Blum, who have shown it to range from 66 to 92 per cent.

The combustible sulphur, by burning finely powdered coke in a current of oxygen, was found to be 1.09 per cent.; and of this more than 15.93 per cent was burnt to sulphur trioxide (SO_3), and not deposited in the condensers. This tendency of the sulphur in the coke to become oxidized in a higher degree than sulphur dioxide (SO_2) increases as the temperature rises and as the excess of oxygen becomes greater.

The further experiments made were to ascertain the behavior of sulphur in the presence of hydrogen, water vapor (steam), nitrogen, carbon monoxide and carbon dioxide. Powdered coke was placed in a porcelain boat, about 4 inches long and ⅝ inch wide, inserted in the combustion tube of a Heræus electric resistance furnace. For recording the temperature, a platinum rhodium thermo-couple was used, which was protected by a thin porcelain tube.

Experiments with Hydrogen.—The purified gas was passed through at the rate of 2 to 2½ liters per hour, over 1½ grammes of coke. At about 470° to 490° C. the acetate of cadmium condenser began to cloud, and a precipitate of sulphide of cadmium took place

Temperature in Degs. C.	Loss on Ignition. Per Cent.	Sulphur Volatilized as Sulphuretted Hydrogen. Per Cent.	Sulphur Volatilized as a Percentage of the Total Sulphur.
500	1.56	0.107	7.59
600	1.82	0.324	22.99
800	2.49	0.590	41.87
900	5.01	0.635	45.77
1,000	10.06	0.721	51.17

As shown by this table, the quantity of sulphur volatilized at 600° C. is three times that at 500° C. Beyond 600° the rate of volatilization increases slowly, until at 1,000 the quantity is rather more than half the total sulphur content. It was found also that, by prolonging the period of the passage of the hydrogen, and maintaining a constant temperature, an increased quantity of sulphuretted hydrogen was formed. For example, at constant temperature there was volatilized in 2½ hours 0.403, and in 6 hours 0.562 per cent. of sulphur. With another sample of coke containing 1.5 per cent. of sulphur, the quantity volatilized as sulphuretted hydrogen in 9¾ hours was 0.737 per cent. of sulphur. The coke was not altered in appearance by any of these tests, beyond turning somewhat darker at the higher temperatures. The degree of applicability of this and the succeeding tests to gas manufacture will be better understood by remembering the temperatures found to exist in the charges of coal by Mr. J. Bond. In the paper read at the recent meeting of the Institution of Gas Engineers, and given in the *Journal* for June 6 (p. 691), he showed these to vary from 400° C. to 1,100° C.

Tests with Steam.—The acetate of cadmium began to cloud at 350° to 380° C., which proves that the hydrogen in the nascent state begins to exercise its influence on the sulphur in coke at a much earlier stage than the pure dry hydrogen. At 900°, the steam volatilizes more sulphur in the form of sulphuretted hydrogen than does pure, dry hydrogen at 1,000°; but this was accompanied by "losses on ignition" of 2, 7, 14 and 9 times that of hydrogen respectively. At 500° and 600°, the coke had not altered in appearance. At 800° the surface seemed to have caked, and the coke adhered firmly to the sides of the porcelain boat—the edges being grey-white. At 1,000°, the mass of coke was grey-white throughout.

Temperature in Degrees Centigrade.	Loss on Ignition, Per Cent.	Sulphur Volatilized as Sulphuretted Hydrogen.	
		Per Cent. by Weight of the Coke.	Per Cent. of the Total Sulphur.
500	2.14	0.181	12.84
600	2.94	0.187	13.27
800	16.72	0.519	36.83
900	70 88	0.726	51.52
1,000	89.18	0.764	54.34

Besides the sulphur given off as sulphuretted hydrogen, a portion of it formed sulphur dioxide (SO_2), and at the higher temperature sulphur trioxide (SO_3). But the tendency to form sulphuretted hydrogen was

found ro be strouger than the tendency to unite with oxygen to form sulphur dioxide. The volatilization proceeds very rapidly, for in one test, at the end of 3 hours, 0.76 per cent. had been driven off as sulphuretted hydrogen. At 1,000° C., the coke was completely incinerated.

Tests with Nitrogen.—Purified gas was passed through the furnace at the rate of 1.3 liters per hour. As it issued from the heated tube in the electric furnace, it was led through two condensers containing alcoholic soda liquor. Lest any loosely combined organic sulphur should have been driven off with the glowing carbon, forming bisulphide of carbon (CS_2) a fixed quantity of the alcoholic soda solution was each time tested for the presence of the bisulphide, but no trace of it could be detected. In the remaining portion of the soda solution, an increase of sulphur was noticeable, corresponding to the diminution of sulphur in the coke. At 1,000° a fairly large percentage of the total sulphur was given off as gas. The authors say there can be no doubt that, together with escaping hydrocarbons, a portion of the organically combined sulphur was carried off by the nitrogen.

Temperatures in Degs. C.	Loss on Ignition. Per Cent.	Sulphur Remaining in Coke. Per Cent.	Sulphur Volalilized in Perceg age of the Total Sulphur
500.....	1.03	1.372	2.41
600.....	1.43	1.337	4.90
800	2.16	1.326	5.90
900.....	2.83	1.308	6.97
1.000.....	4.50	1.162	17.35

Tests with Carbon Monoxide.—Purified gas, admitted at the rate of 1.5 liters per hour, was passed off from the electrtc furnace through two condensers with measured quantities of potash liquor containing bromine, which were intended for the absorption of the volatilized sulphur.

Temperature in Degs. C.	Loss on Ignition. Per Cent.	Sulphur Remaining in Coke. Per Cent.	Sulphur Volatilized in Percentages of the Total Sulphur.
500.....	1.49	1.226	12.80
600.....	1.69	1.171	16.89
800.....	2.20	0.975	30.80
900.....	2 35	0.879	37.61
1,000.....	3.06	0.869	38.32

The table shows that with losses on ignition that were not great the proportion of sulphur volatilized increased oonsiderably from 500° C. upwards. The organic sulphur probably partly combined with the carbon monoxide to form oxysulphide of carbon (COS), which is immediately split up in the condensers into carbonic acid and sulphuretted hydrogen. The bromine then causes the latter to oxidize to sulphurie acid (H_2SO_4). It was also observed in these experiments that carbon monoxide was decomposed, and that this not only occurred at the lower temperatures, but continued as the temperature rose. The heaviest deposit of carbon was always observed at 1,000° C.; but it is doubtful whether at this temperature the equation $2CO = C + CO_2$ still holds good since the reduction of carbon dioxide by means of carbon has then become very active, and its formation would, therefore, be hardly likely to occur. In every test it was found that the potash solution with bromine had absorbed carbon dioxide. The effect on the sulphur in the coke of the decomposition of the carbon monoxide may be represented thus:

$$\left.\begin{matrix}CO\\CO\end{matrix}\right\} + S = C_2 + SO_2.$$

Tests with Carbon Dioxide.—Purified gas was admitted to the tube heated by the electric furnace at the rate of 2 to 2.3 liters per hour, and was thence led through condensers with bromic hydrochloric acid or permanganate of potash. Up to 900° C. the quantity of sulphur volatilized as sulphur dioxide (SO_2) increased very slowly, and at 1,000° it amounted to only 18.29 per cent. of the total sutphur. But the sulphur volatilized in all its forms was 59.25 per cent. of the total, leaving 40.75 per cent. unaccounted for. This is explained by the formation of sulphur trioxide, which cannot be traced in the condensers:

$$3CO_2 + S = 3CO + SO_3$$

Carbon dioxide + sulphur = carbon monoxide + sulphur trioxide.

This difference, due to sulphur trioxide, sets in at about 800°, is noticeable at 900°, and is quite marked at 1,000 C.

Temperature in Degrees Centigrade.	Loss on Ignition, per Cent.	Sulphur Volatilized as Sulphur Dioxide, per Cent.	Sulphur Remaining in Coke, per Cent.	Total of Sulphur Volatilized in Percentage of Total Sulphur Content.
500.....	0.98	0.101	1.315	6.47
600.	1.08	0.144	1.289	8.32
800.....	3 56	0.175	1.181	16.00
900.....14.54		0.190	1.048	25.46
1.000.....51.71		0.257	0.573	59.24

In these tests, the burning of the sulphur to sulphur dioxide depends on the reduction of the carbon dioxide at higher temperatures by contact with carbon. According to Naumann and Pistor, the reduction begins at about 530° C., when the gas comes in contact with glowing carbon; but it depends also on the surface of contact. In the same manner, then, as the carbon is attacked by carbon dioxide, the sulphur of the coke is also carried off by oxidation, and unites with the carbon dioxide. The two actions are represented:

$$2CO_2 + C_2 = 4CO.$$
$$2CO_2 + S = 2CO + SO_2.$$

The tendency to produce sulphur trioxide at temperatures above 800° C. was confirmed by another series of tests in passing carbon dioxide over the heated coke.

The authors then proceed to discuss the absorption of the sulphur, when disengaged from the coke, by the high temperatures and the gases already referred to in the blast furnace. Their conclusions are as follows: (1) That up to 500° the sulphur of the gases as taken up by the ferric oxide alone. (2) At 600° the limestone scarcely exercises a perceptible influence on the absorption of the sulphur. At 800° the conditions suddenly change, and the limestone then far outstrips the ferric oxide in its capacity for the absorption of sulphur from the gases. This is the temperature at which the limestone ($CaCO_3$) begins to decompose more rapidly, and the combining of the sulphur is therefore to be attributed to the formation in the first place of lime (CaO).

Gas for the House: Suggestions for the Inspection and Supervision of Consumers' Fittings and Burners, and the Establishment of Central Stores and Showrooms.

[A paper read by MR. W. B. MCLUSKY, at the last meeting of the North British Association of Gas Managers]

This subject has, in one or two important particulars, engaged the attention of the North British Association of Gas Managers in former years. The following report was submitted at the annual meeting in 1887: "The remit on the best standard burne r for Scotch gas has been under the consideration of the committee, and it was resolved to place the results of the testings of burners by the five previous operators in the hands of Mr. George R. Hislop, the convener of the sub-committee on the question."

At the same meeting Mr. Hislop read a paper on "Standard Burners and the Propriety of Supplying Consumers Gratuitously with the Burners Best Adapted for the Gas Supplied." In the following year (1888) Mr. Hislop made a further valuable contribution to the subject in his paper dealing with the relative results obtained with different qualities of gas burned at a constant pressure through No. 7 union jet burners drilled at various angles; and Mr. James McGilchrist read a paper entitled, "Selling Gas," in which he described (1) "The ideal gas undertaking which would look to the piping and lighting arrange ments within the houses of their consumers," (2) "Would abolish rents for meters," (3) "Would introduce a system of payment approximating to the ready money system," (4) "Would canvass vigorously for business on the system which is common in ordinary commercial pursuits."

Flat flame lighting was almost general in those days, the Welsbach incandescent mantle being in the experimental stage; and a very small proportion of the output was used for cooking, heating, or power purposes At the present time it is estimated that fully 60 per cent. of the gas used for lighting is consumed with incandescent burners; and wherever proper facilities have been offered, and the business systematically pushed, 50 per cent. of our consumers use gas for cooking and heating. It will be freely acknowledged, therefore, that if skilled supervision and control of consumers' fittings and burners was necessary 20 years ago, when practically only one type of burner was used, the demand to-day is most urgent, when there is a large variety of burners and appliances in use for lighting, cooking and heating purposes. In flat flame lighting the "preventable loss" due to the use of unsuitable burners amounted to 25 per cent. of the gas registered at the consumer's meter. With incandescent lighting the proportionate loss per burner has not been materially reduced, because the success of this system depends upon skill, not only in fixing, but in maintaining the burners and mantles, etc., in proper working order; and in the carrying out of this important work our consumers have, hitherto, been left to their own resources. We cannot expect consumers to grapple with such problems as the proportion of air to gas in the Bunsen tube, length and diameter of mantle, chimney, etc., in relation to the hourly rate of consumption and quality of gas supplied; and it is out with the province of landlords, architects, builders, or even gasfitters to relieve the gas supplier of his responsibilities in these essentials to successful

gas lighting. It is clearly our duty to step in and assist the consumer from whom we collect gas rental as per meter index, whether the quantity registered has been economically consumed or partially destroyed.

The average duty of flat flame burners in Scotland may be taken at 3¾ candles, and that of incandescent burners of various types at 25 candles per cubic foot of gas consumed. The incandescent burner, therefore, produces 6⅔ times more light per unit of gas than the flat flame. The 60 per cent. of incandescent burners in use are providing 10 times more light than the remnant 40 per cent. of flat flames; and the total distribution of gas light to-day, exclusive of new business, is 4⅓ times greater than it was before the introduction of the incandescent system. These are the results which are actually obtained wherever the lighting is controlled by municipalities, gas companies, mill owners, engineers, or business men; and the revival of gas lighting and the return of many consumers who for a time preferred electricity is largely due to the successful installations of modern gas lighting carried out under such auspices.

"Gas for the house" has not, however, been fostered to the same extent. Engineering skill and expert advice have not yet reached the homes of the people. We have found the working up of secondary products at the gas works worthy of all the skill at our command. Why should we deny our consumers the benefits of skilled advice in the utilization of the prime product?

It may be urged that work of this description comes properly within the scope of the gasfitting trade, but I submit that it is the business of the gasfitter or trader to sell, and the duty of the gas supplier to see that his consumer is provided with fittings and burners capable of producing the highest possible duty from the gas consumed. The gas supplier is bound by Act of Parliament to supply a standard quality of gas, and he is morally bound to ascertain whether the consumer is obtaining standard results. Standard results cannot be expected, however, so long as we are without a standard regulating the supply, fixing, and maintaining of fittings and burners. Every branch of engineering or constructional work is conducted in accordance with a recognized system, specification, or classification; but gasfittting is still carried on without survey or disinterested control of any kind. Almost a quarter of a century ago this Association adopted Mr. Newbigging's standard specification for the guidance of builders, architects and gasfitters, in the laying of gas pipes, but for want of a proper working arrangement between the trade and the supplier of gas little practical benefit has resulted, and notwithstanding improvements in burners and the development of the incandescent system, cases of defective lighting, waste of gas and dissatisfied consumers are by no means uncommon.

The evidence of all those years of failure to solve the problem proves that there are difficulties in the way, but from careful study of the question I am convinced that all those difficulties may be removed by the unification of the interests of the gas supplier, the gasfitter and the gas consumer. As suppliers of gas we have only one end in view, viz.: to provide the consumer with an efficient and economical light at every burner in his premises. To accomplish that end I have drafted the following scheme as the basis of co-operation and combination between the trade and the gas corporation or gas company in every town, and now submit it to the earnest consideration of this Association:

1. That the gas corporation or company should establish a central wholesale store for the sale to the trade only of fittings, burners, mantles, etc., at net prices.

2. That one or more showrooms, according to requirements, should be opened by the gas corporation or company where such fittings and burners would be exhibited, and their use demonstrated to the public, every article being marked at list prices mutually agreed to by the trade and the gas corporation or company.

3. That a list of gasfitters, approved and accepted by the gas committee or board of directors, be exposed in a prominent place in the showroom.

4. That consumers' orders be received at the showrooms, and immediately transmitted to the gasfitter named by the consumer.

5. That in the event of the gasfitter desiring the gas corporation or company to execute the order for him, this should be done, and the gasfitter charged with the cost per burner or fitting fixed, on a scale of charges agreed upon, in addition to the net cost of the fittings or burners.

6. That orders for gasfittings and burners should be received at the shop or workshop of every approved trader and transmitted to the stores or showrooms of the gas corporation or company for supply only, or for supply and fixing outright, as the case may be.

7. That the gas corporation or company should officially inspect all work done by their own or other fitters.

8. That the gas corporation or company should maintain in an efficient state of repair all burners and mantles in consumers' premises on a scale of charges covering net outlays.

In discussing these proposals it must be borne in mind that gasfitting in Scotland is a subordinate branch of the plumber's or tinsmith's trades, and that sanitary engineering and electric lighting, which are the main features of the progressive plumber's business, are more attractive pursuits than the fixing of incandescent burners which cost 9d. each and are sold at 1s. The busy tradesman has not the time at his disposal to follow the development of gas lighting. It is part of the gas engineer's work to do so. If the gasfitter is to keep abreast of the times he must constantly replenish his stock, and realize upon that which is obsolete. On the one hand this does not profit the trader, and on the other it induces gas consumers to purchase antiquated and unsuitable fittings.

One central store and one stock for the trade of each town will serve consumers' wants in lighting as well as it has already done in regard to cooking and heating stoves, and consumers, traders and the corporations and companies will participate in the economic advantages attending the delivery of goods in large lots in the original packing cases, reduced cost for carriage, less risk of breakage, and the general convenience of a large and varied selection of modern fittings and burners on view and available at a moment's notice.

A decrease in consumers' lighting accounts may be expected, and this will popularize the use of gas for lighting and other purposes. A substantial increase in business will eventually result, and the continued and increasing prosperity of our gas undertakings will be assured.

Discussion.

Mr. D. Robertson, Dunoon, said Mr. McLusky's paper was a short one, but it contained several ideas that were very well worth their consideration. The author had given them something of very excellent quality and something which came home to them as purveyors of gas. Every gas manager must have felt many a time that the product he was sending out was being spoiled, in a manner. And what annoyed him still more was that he had no control over the gas after it had been delivered to the consumer. The misguided consumer very often blamed the gas when the fault lay in his fittings or burners, which frequently robbed him of 50 per cent. of the lighting power of the gas. He had frequently been sent for personally to inspect the gasfittings and had found that faults were due entirely to inferior burners and fittings; and it was significant how pleased the consumers were when it was pointed out to them that this was the cause of complaint. In his district they were flooded with cheap incandescent burners—he did not know where they came from, but every day he was coming across burners that did not consume the gas properly. The consumer did not understand this, and if he was not inclined to blame the gas manager he thought it was the mantle which was at fault. Sometimes he supplied a new burner just to prove that it was the burner that was at fault, and he thought that was more convincing than all the arguments they could use. The consumer was satisfied and came to the conclusion that the gas manager knew something about gas lighting, and, as a consequence, consulted him when he next had trouble with any of his burners. It was sometimes heart-rending to see the kind of work that was done by gasfitters, though he was free to admit that many fitters made a good job. He blamed the specifications drawn up by architects for much of the bad work done by gasfitters, for many of these specifications left so much margin or loophole that a gasfitter, who wished to get a job, could put in almost anything in the way of size and quality of pipe. The specifications were so loose and the prices cut so fine that the man who got the job had to put in something of very inferior quality so as to make a profit. The architect ought to specify in such a way that the gasfitter would be bound to do the work in a way that would serve the purposes for which it was intended. He had seen composition pipe simply rolled on the joists without any attempt at stretching it, with the result that the pipe in a very short time hung in loops between the joists, and it was impossible to use a wet meter in connection with such work. Then, again, when a wet meter was placed in a warm kitchen, as it often was, it acted simply as a small steam boiler and the water evaporated from it condensed in the loops he had referred to, and then trouble began. He thought Mr. McLusky's idea of having the gasfitters coming to the gas office for their supplies of material was a good one, for the gas manager would be able to choose the very best fittings on the market and the gasfitters would have no personal interest in putting in cheap, inferior goods. The only question that occurred to him in connection with the central store room proposed by Mr. McLusky was the increase in the already wide duties of the gas

manager that it would involve. In the case of large works a man could be put in charge of the store, but in small works they could not afford this till the business had been considerably extended.

Mr. A. Yuill, Dundee, said he thought they were all in agreement with the suggestions in the paper. With reference, however, to the inspection and superintendence of the fittings by the gas department, so far they had not the power to enforce inspection of pipes and fittings, but it was a question whether they should not ask for powers similar to those given to water undertakings, both for the benefit of the gas consumer and as a measure of public safety, more especially where water gas was being largely introduced. This matter had been under consideration in Dundee, and the probability was that when they next had to apply to Parliament they might ask for powers to inspect gas pipes and fittings.

Mr. D. Macfie, Edinburgh, said it was more difficult to find anything in the paper to differ from than to agree with. In his address, the president said that at one time the supply of gas was a monopoly, but that day had passed. Before the gas meter was introduced, gas was sold by time, and then it was not to the interest of the gas manager to look after the consumption. The introduction of the meter, he was afraid, caused the manager to pay less attention to how the gas was burned, because the consumer had to pay for the gas, whether he wasted it or burned it properly. They had travelled far since that time, but it was not till the general introduction of the gas range that the gas manager thought it his duty to push the sale of gas by direct contact with the consumer. This had given rise to a good deal of heated discussion between the gas suppliers and the gasfitters. Had the gasfitters pushed the sale of stoves as they might the gas suppliers might have been content. He thought the very diplomatic and thorough set of rules drafted by Mr. McLusky would meet all the difficulties that had arisen. In this connection he also thought that more use might be made of the table of sizes for gas pipes which was drawn up by the Association some years ago. This should be distributed among architects, because it was not fair to blame the architects when they had not the necessary information before them.

Mr. J. W. Napier, Alloa, said he had drawn out certain instructions for the guidance of architects, and now he had no trouble. He thoroughly and enthusiastically agreed with the maintenance of incandescent burners at net cost.

Mr. James McFarlane, Maybole, raised the question of legal responsibility. Should gas companies undertake the inspection of fittings? When an accident happened from work done by a gasfitter the consumer could not get anything out of the gasfitter because, as a general rule, he had nothing. But it would be different with a gas company, and to be mulcted in £500 damages would be a serious matter for a small gas company.

Mr. W. Carmichael Peebles, Edinburgh, thought gas pipes might be subject to rules as electric light services were. He had known gasfitters who had to ask how to read a pressure gauge, and he did not think such men were capable af advising gas consumers.

Mr. W. F. Vernon, Coupar Angus, spoke of the cheap nostrums of incandescent burners that were on the market, and expressed the opinion that if gas managers were given the power to oversee gasfittings all avoidable cause of complaint would be removed.

Mr. A. Mackay, Montrose, said he considered that the men who made the gas ought to see that it was properly consumed. Since he went to Montrose he had taken up the sale of gas appliances at cost price. After 11 months' working he had a credit balance of only 5s. He did not give burners that required to be regulated but burners that did not require to be touched. The plumbers in his locality were entirely ignorant of incandescent lighting, but they were capable of canvassing the town on behalf of the electric light company.

The President, in calling upon Mr. McLusky to reply, said there was no doubt at all that it was to the advantage of the gas supplier to educate the gas consumer. He blamed the architects more than the gasfitters for the present condition of affairs, as the architects were the parties who specified the work to be done.

Mr. McLusky, in the course of his reply, said that in his experience of incandescent burners bad burners had increased the gas bill. The object he had in view in submitting his scheme was to secure co-operation between the gas department and the gasfitters. With regard to the legal responsibility, that would no doubt be settled when they got their parliamentary powers to inspect. It should be remembered that when the gasfitters were not with them they were against them, and they were one hundred to one gas manager; and if they did not know much about gas lighting they were capable of recommending a consumer to adopt electric light.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

By the blowing up of a giant new gasholder recently, the New Orleans Lighting Company practically signalizes the doubling of the storage capacity of its plant. Slowly and majestically the great sections rose into the air, not by force of giant powder or dynamite, but simply pure air, supported by strong yet graceful framework, until a height of about 120 feet had been reached. Air was used simply to test the working of the new holder. When filled completely the holder will rise at least 30 feet higher, but the unfinished condition of the supporting structure will not allow of its full expansion for several days. It has the distinction of being the largest gasholder in the South, and when completed will have cost approximately $75,000. With a capacity of 1,018,000 feet of gas, it almost equals the storage room of the other five holders of the Company, which combined give a capacity of 1,200,000 feet. T. D. Miller, general manager of the New Orleans Lighting Company, said that the doubling of the capacity would make the supply of gas more secure in every way. "Why, last winter," he continued, "when we were sending out 3,000,000 feet of gas a day, a breakdown lasting over a period of eight hours would have left New Orleans in darkness as far as gas was concerned. Now, with greatly increased storage room, there is no possibility of any such happening. We expect to turn gas into the new holder within 20 days." Mr. Miller also said that if the city continued to grow as it had in the past two years, in all probability the Company would erect another giant holder next year, which would differ from the one just completed in the small matter of having a capacity of about 2,000,000 feet, instead of 1,018,000 feet. Other signs of progress are in the air. There is now under construction a plant for the manufacture of Pintsch gas, and a new compressor engine, which will give 50 per cent. more pressure than the old one, is being established. The necessity for more storage room became apparent to the Company 18 months or 2 years ago, and plans for a new holder were at once taken under consideration. The contract for the structure now practically completed was let a year ago last June, and it was understood that the holder was to be ready for gas on the 4th of July, 1905. The work was kept well within the contract time, and the holder would have been finished by the national holiday, were it not for the fact that the last carload of material for the supporting structure had the misfortune to be carried by the train that was wrecked by an explosion of giant powder at Kenner, about three and a half months ago. The car of steel framework was twisted beyond hope, and thus one blowup delayed the more statlier one that announced the completion of the big storage room. The new holder is 110 feet in diameter and 152 feet in height. It is the intention of the lighting company to erect a 30-foot flagpole on the top of the supporting structure, which will give a distance of 182 feet from the ground to the tip of the pole. It was necessary to use 240 piles in the foundation, driven to a depth of 40 feet. The steel for the structural work and the sections of the holder, four in number, and a large tank for water, was shipped to this city in small plates and put together one by one at the scene of the work. Some idea of the immense size of the holder can be gained from the fact that more than 6,000,000 rivets hold its parts together. This portion of the work called for special care, on account of the near proximity of the storage yard to the Charity Hospital. In the wards of the hospital were many people seriously injured or sick almost unto death, and the incessant noise of the pneumatic riveter would have been fatal to some of the sufferers. So it was that the majority of the 6,000,000 rivets were placed in position by the hydraulic riveter, which has a pressure of 40,000 pounds to the square inch, and which makes no noise whatever in its work. The steel work for the new holder was contracted for by R. D. Wood & Co., of Philadelphia. A plant for the manufacture of Pintsch gas, which is used largely by all railroads for the lighting of passenger coaches, has been a long felt want in New Orleans. The lighting company decided to install such a plant several months ago, and plans were drawn up immediately. The contract for the holder which will be a baby in size beside the other storage tanks of the plant, has already been let, and the work on it is now in progress. Bids will be asked for the building, and it is expected the entire plant will be completed during the fall. The manufacture of Pintsch gas requires special apparatus of every kind. Pipes will be run to several of the railroad depots throughout the city. An idea of the great expansion of the New Orleans Lighting Company can be gathered from the fact that the entire gas plant, many years ago, was housed in one building, with dimensons of probably 25 by 70 feet. The old building is still standing, almost as good as new, but instead of containing the whole plant, it now has its hands full to take care of the compressors alone.

THE Binghampton (N. Y.) Gas Company has been doing considerable good work on the quiet among those who suffered most through the recent disastrous tornado. Wherever it was found that a stove or any of the pipe fixtures had been ruined it was replaced free. In some cases new stoves were given and in others quite extensive repairs made, averaging with each person so helped about $5. Ernest Eysenbach is the right man in the right place.

A RUMOR that the Gas Company of West Chester, Pa., is about to sell out to a new Philadelphia syndicate is not confirmed, although it is admitted that several parties lately have been examining the plant and offers have been made for stock.

THE Carthage (Mo.) gas plant, damaged considerably by Thursday's flood, was repaired sooner than was thought to be possible. By keeping a force of men at work in the gas plant night and day since the water of Thursday's flood went down, the Gas Company was able to give its patrons a means of illumination on July 23d.

MR. M. P. MALONEY, for several years Superintendent of the El Paso (Tex.) Gas Company, has accepted a position with the Albuquerque (Mex) Gas Company.

THE Cambria (Wis.) gasoline gas plant blew up and is a total wreck --the personal damage to Superintendent Williams was slight.

THE introduction of an ordinance in council to grant the Alliance (O.) Gas and Eleciric Company the privilege of furnishing through their present system natural gas to consumers, has awakened considerable interest locally.

THE Alton (Mo.) Gas and Electric Light Company has asked a franchise from the Upper Alton Village Board to extend their gas mains through the streets.

IT is now the turn of St. Joseph, Mo., to wrestle with that subtle question, "Does *gas* mean any old gas, or manufactured gas, when mentioned without qualifications in a franchise." St. Joseph will substitute natural for manufactured gas?

WHEELING, W. VA., suspects a conspiracy is being hatched to sell out her municipal gas property. It might be to her advantage for the conspirators to be successful.

ALFONSO L. RIGGS, Wm. E. Hairus and Owen L. Carr have incorporated the Rushville Gas Company, of Rushville, Ind.

THE city council of Raton, N. M., has granted a franchise for 50 years to John Morrow, Jeremiah Leahy and Thomas B. Hart, for the manufacture of gas for illuminating and heating purposes in that city.

CRESTON, IA., now gets gas for illuminating at $1.75 per 1,000 and for fuel at $1.50 for 1,000.

THE Hastings (Mich.) Gas Company, has sold its plant, which has just been installed, to Thornapple Electric Company, which will hereafter be known as Thornapple Gas and Electric Company. The new Company has inauguarted business with substantial reduction in rates.

THE Everett (Wash.) Gas Company, by its manager, P. E. Hall, Jr., has petitioned the Board of County Commissioners for a 50-year franchise to furnish gas in Lowell and along the county road between Everett and Snohomish. The franchise is asked for on condition that the piping shall be completed within 16 months of the legality of the grant.

FRED HAGERMAN, who has been in the employ of the Consolidated Gas Company for the past 5 years, has been appointed manager of a gas plant at Mahanoy City, Pa. Mr. Hagerman has been trained in all the branches of the business under Manager W. B. Tuttle who takes a special interest in the advancement of his aides.

THE Wayne General Construction Company, of Fort Wayne, Ind., has filed at Auburn, a petition for a gas franchise in the DeKalb county seat.

SPECULATION as to what the Logansport and Wabash Valley Gas Company are going to do with the miles of old gas pipe that they are digging from the streets of this city and between Logansport and Kokomo, has at last been set at rest by the announcement by Superintendent Powell, of the local office, that a pipe line from Logansport to Wabash through Peru, for the serving of both those cities with artificial gas would be laid. Already the work of enlarging the gas plant in this city has been commenced, and will be pushed to a hasty completion. It will take at least 2 months to finish the work. The plant will then be double its original size.

THE United Gas Improvement Company, on July 25th, made to City Controller Walton, its quarterly statement of sales upon which the city receives a dividend. For the 3 months ending June 30, there were sold 1,533,925,530 cubic feet of gas. There was collected in cash $1,659,547.12 and from this the city receives 10 per cent. of $165,954.71. During the first quarter of this year the city's share was $188,739.46. During the second and corresponding quarter of 1904 the city's share was $159,658.35.

WHEN employees of the Milwaukee (Wis.) Gas Light Company received their pay on July 25th, they received additional compensation checks equalling 6 per cent. of their wages for the past 6 months.

THE State Board of Valuation and Assessment took action as to the Louisville (Ky.) Gas Company and the Louisville Lighting Company, in the matter of the value of the franchises of these companies for the purposes of taxation, almost doubling the total valuation placed upon each company over the assessment of last year for the same purpose. The total valuation of the Louisville Gas Company was fixed at $3,600,000, as against $1,923,953 for the year 1904. Of this $3,600,000, the tangible property is valued at $595,805, and the franchise at $3,004.195. On this franchise valuation the Company will be called upon to pay in taxes to the State the sum of $15,020.98. The total valuation placed upon the Louisville Lighting Company was $3,500,000, as against $1,335,166 for the year 1904. Of this $3,500,000, the tangible property is valued at $550,360, leaving a franchise valuation of $2,969,640. On this assessment the Company will pay into the State Treasury the sum of $14,949.20.

THE Stone & Webster Company, of Boston, Mass., who control 26 railway systems have bought the Paducah City Railway Campany, capital, $300,000; bonds, $650,000; $14\frac{5}{6}$ miles of track; Paducah Gas and Fuel Company, capital, $200,000, bonds, $100,000; Paducah Steam Heating Company, capital, $100,000, bonds, $50,000. With them it is understood are interested a number of Louisville people, whose interests are being looked after by Mr. Clarence Dallam, of Louisville, Ky. The local stockholders of the concerns will retain 30 per cent. of their stock, but will all resign their positions.

THE Hazleton (Pa.) Gas Company, is asking the West Hazleton Council for rights to lay pipes therein.

MR. JAMES W. ORME acting President of the Washington Gas Light Company, died suddenly, in his office on 10th street, as a result of a cerebral hemorrhage. He was born in Washington, D. C., about 67 years ago, and was educated in the local schools to enter business with his father. He was identified with a number of local business institutions and for a number of years had been a director in the Washington Gas Light Company, in which he has a large interest. During the absence of Mr. John R. McLean, Mr. Orme was acting President of the Company.

THE Kansas State charter board granted a charter to the Wellsville, (Kas.) Gas Company, capital $10,000.

A MERRY war rages at Los Angeles, Cal., between the Lowe Company and the Los Angeles Lighting Company, attachments being served by the old company on consumers using the new gas company's product.

PONTIAC, MICH., plans to have the Pontiac Light Company given the contract to light the city streets at the same rate as now paid the Standard Lighting Company, on consideration that the gas company lower its rates to consumers.

THE Columbus, (O.) Gas Company is again making pitch as they were not able to sell their tar to as good advantage.

THE Lower Allen Fuel Gas Company was granted a charter to furnish gas to Lower Allen, Upper Allen, New Cumberland and Shiremanstown, Cumberland county, with a capital of $5,000. The Treasurer and incorporators are: J. H. Geist, J. H. Slattery, and J. A. Slattery of Philadelphia, and J. G. Diffenderfer, Steelton.

The Market for Gas Securities.

The Peoples Gas Light and Coke Company, of Chicago, has declared the regular quarterly dividend of 1¼ per cent. payable August 25th. The transfer books close August 12th and reopen August 26th. It is rumored that strong interests have been accumulating the stock, and much higher figures are predicted for it. Consolidated gas sold up to 193 during the week, but lost some of the advance at the close to-day. The volume of business in gas securities during the week has been very light, with a strong undertone.

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NOTICE.

The city of Fort Wayne, Ind, through its Board of Public Works, will receive proposals for the construction and installation of a Gas Plant within the corporate limits of said city of Fort Wayne, for the purpose of manufacturing and distributing gas to the inhabitants thereof, for fuel and illuminating purposes. The term of contract upon which proposals will be received is 25 years.

Detailed specifications can be obtained by applying to Board of Public Works of the city of Fort Wayne, Ind. All proposals to be submitted by twelve (12) o'clock noon of Aug. 24, 1905. Each proposal must be accompanied with a certified check for five thousand dollars ($5,000), conditioned that he, they or it will enter into contract if proposition submitted is accepted. 1571-2

NOTICE TO BIDDERS.

DEPARTMENT OF PUBLIC WORKS, OFFICE OF BOARD, ROOM NO. 5, COURT HOUSE, INDIANAPOLIS, IND., July 7, 1905.

Notice is hereby given by the Board of Public Works of the city of Indianapolis Ind., that sealed proposals will be received by it, at its office, at the hour of 10 o'clock A.M. on the 23d day of August, 1905, for a franchise for the construction and operation of a fuel gas plant and distributing system in said city, according to the franchise grant, privileges, restrictions, limitations and penalties as set forth in the specifications therefor, adopted by the said Board of Public Works of the city of Indianapolis on the 7th day of July, 1905, and which are now on file in the office of said Board of Public Works, and which will be forwarded upon application therefor to said Board. Each bid shall be accompanied with a deposit of twenty-five thousand ($25,000) dollars cash, to be held by the said Board of Public Works of the city of Indianapolis for the purposes and conditions as set forth in the said specifications for the said franchise, adopted on the 7th day of July, 1905. Bids will be received (1) per 1,000 cubic feet of manufactured fuel gas, (2) per 1,000 cubic feet of natural gas, and (3) per 1,000 cubic feet of mixture of natural and artificial gas, stating the percentage of natural gas to be used in said mixture. The Board of Public Works of the city of Indianapolis expressly reserves the right to reject any and all bids or proposals. M. A. DOWNING, President.

JACOB WOESSNER, DAVID WALLACE,
Board of Public Works of the City of Indianapolis, Ind.
1574.1

SEALED PROPOSALS.

OFFICE CITY OF GUELPH LIGHT AND POWAR DEPT., GUELPH, ONTARIO, July 31st, 1905.

Sealed proposals will be received at above office until 12, noon, on Aug. 22, for the erection of three buildings and apparatus consisting of retorts, exhausters, condensers, scrubbers governor, holder, water gas apparatus, etc. Plans and specifications may be seen at office as above and at the office of James Gardner, Jr., Co., 202 Lewis Block, Pittsburgh, Pa.
1574-2 JOHN YULE, Manager.

Position Wanted

By a young man of experience, familiar with the manufacture and distribution of coal or water gas. Able to make himself generally useful in any branch of the business. Address, "POSITION,"
1574-1 Care this Journal.

Position Wanted.

Young man, with 6 years' experience in gas business, desires a position as assistant superintendent or foreman of gas company under progressive management. References as to character and ability from present employers. Address, "F.,"
1573-2 Care this Journal.

Position Wanted

By man with 15 years' experience in the details of construction, operation and management of gas property. Is at present managing superintendent of Eastern gas company in city of 20,000 population. Has rebuilt the works and doubled the output in the past 5 years Would like position with a company that has a somewhat larger field and needs pushing. Highest references as to ability.
1574-2 Address, "A.," care this Journal.

Position Wanted

By a married man of 30; seven years' experience. Competent to place and install high and low pressure mains. Thoroughly familiar with services, governers, meters, fuel, illumination and the installation of all gas appliances. Address, "A–No. 1,"
1574-1 Care this Journal.

WANTED,
Experienced Gas Maker

To operate Lowe improved water gas set. Address, "F. W. C,"
1573-2 Care this Journal.

FOR SALE. The Consumers Gas Trust Co., of Indianapolis, Ind., offers for sale its entire plant in side of the corporate limits of Indianapolis, consisting of all its high and low pressure mains, including all service connections belonging to the Consumers Gas Trust Co., reserving therefrom only cash in bank and bills, accounts and other moneys receivable, office fixtures and real estate at the southwest corner of Illinois and 23d streets. Sealed bids will be received until 12 o'clock noon on the 11th day of Sept., 1905. Each bid must be accompanied with a certified check on some bank or trust company in the city of Indianapolis for the sum of fifty thousand (50,000) dollars, payable to the company, which will be held as a forfeit as agreed and liquidated damages, without returning in whole or in part in case the bid is accepted and not fulfilled. The Consumers Gas Trust Co., by its directors, reserves the right to reject any or all bids. All bids and communications should be addressed to Horace McKay, Chairman of the Finance Committee, 31 North Pennsylvania street, Indianapolis, Ind. There are no liens of any kind upon the property.

(Signed) HORACE McKAY,
Chairman Finance Committee.
Attest: BEMENT LYMAN,
Secretary.
Indianapolis, Ind., May 27th, 1905. [Seal.]
1566-3m

WANTED,
Second-Hand Exhauster,

With 8-inch, 10-inch or 12-inch connections.

Address, NORTHAMPTON GAS LIGHT CO.,
1573-2 Northampton, Mass.

PURIFIER FOR SALE.

Three Second-hand Boxes, 12 feet by 16 feet by 4 feet deep, with 12-inch Bahret centerseal, complete. Boxes perfectly sound, and covers in good condition. No supporting columns or beams. Delivery, f.o.b. cars, Wilkes-Barre, Pa.

Address, F. H. SHELTON,
1572-4 1004 Pennsylvania Building, Philadelphia.

FOR SALE,
22-HORSE POWER HOWE COMBINED GAS AND GASOLINE ENGINE,

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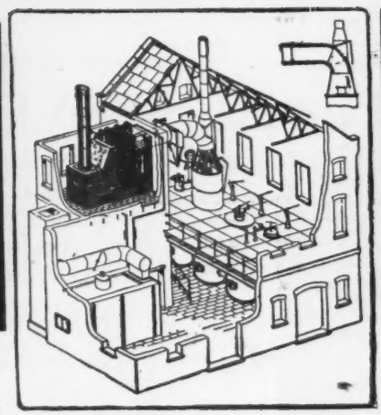

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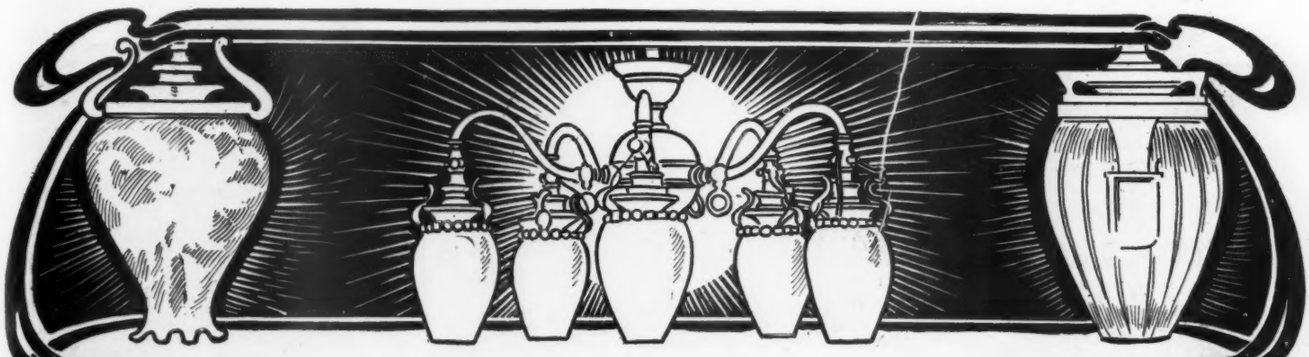

GAS MANUFACTURERS AND DEALERS, ATTENTION!

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(NEW NAME)

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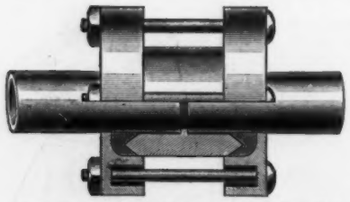
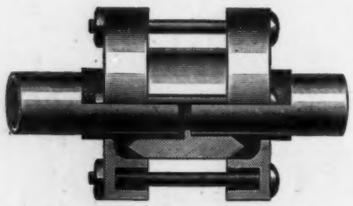
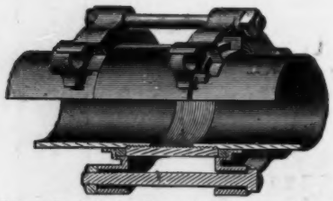


Regular Coupling, Style 1, for Plain End Wrought Iron Pipe.



Insulating Coupling, Style 8, for Plain End Wrought Iron Pipe,



Clamp, Style 4, for Repairing Leaks on Screw Collar.

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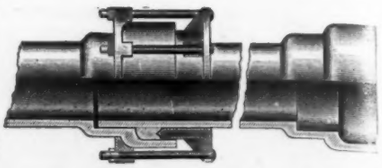
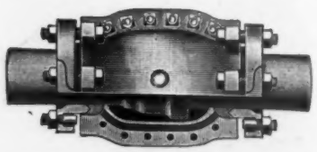
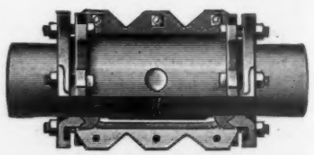


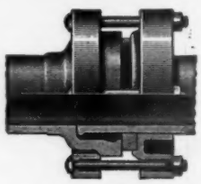
Coupling, Style 9, for Special Style Cast Iron Pipe.



Split Sleeve for Repairing Broken Bell on Cast Iron Pipe.



Split Sleeve for Repairing Broken or Cracked Cast Iron Pipe.



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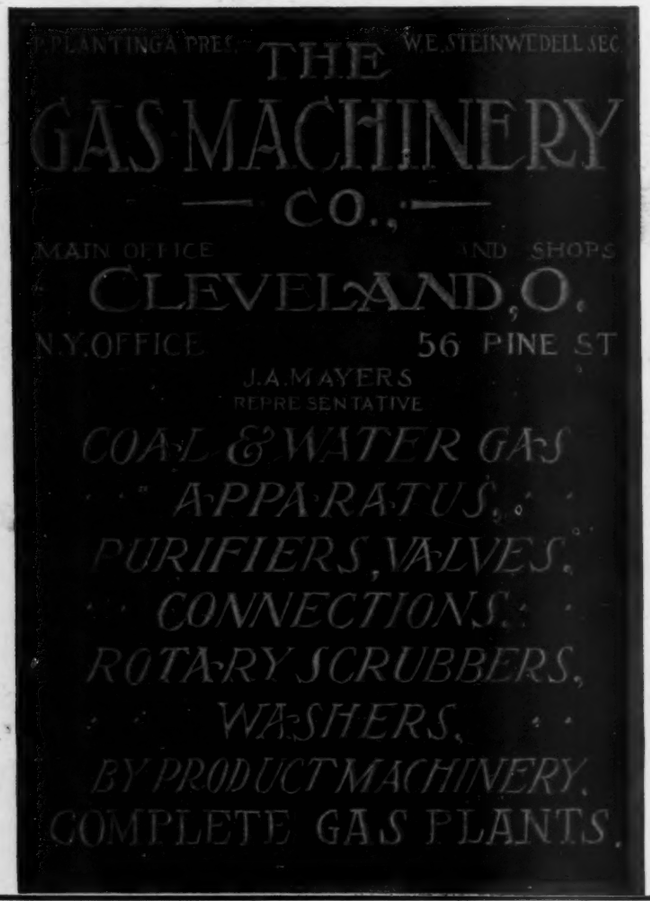

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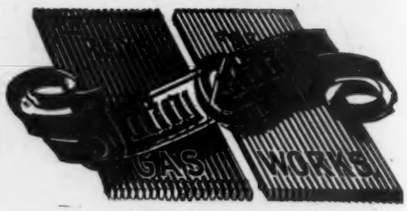

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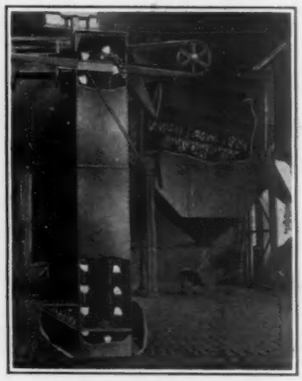

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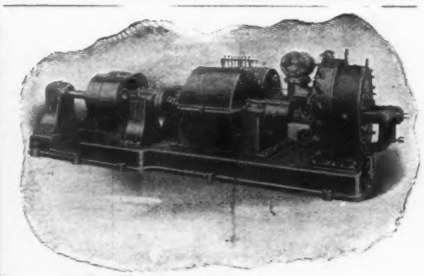

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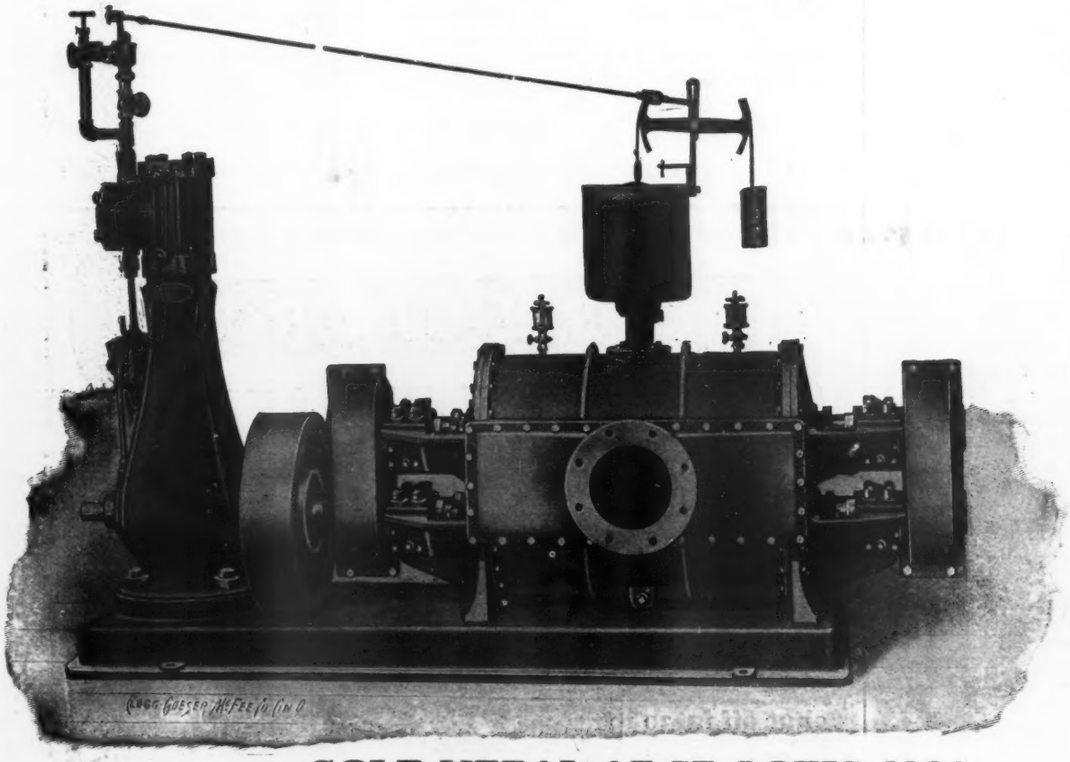

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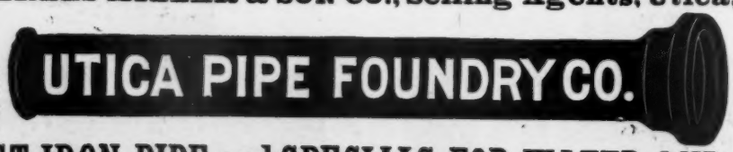

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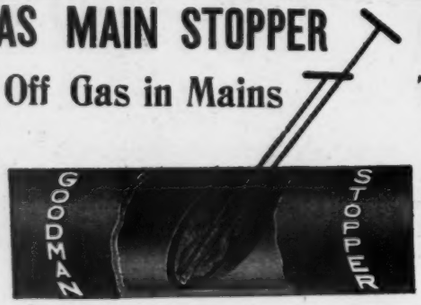
For Shutting Off Gas in Mains

Any size gas main can be shut off in 30 seconds. : : :



Temporarily during alterations and repairs. : : : :

STOPPERS SENT ON TRIAL.

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FOR BATHROOM AND KITCHEN

is most easily, quickly and economically supplied by a

Humphrey Crescent Instantaneous Water Heater.

This is No. 2.

Height, 36 inches. Diameter, 12 " Shipping weight, 80 lbs. Net weight, 50 lbs. The products of combustion are entirely separate from the water. Entire water surfaces are tinned.

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Prices range from $20 to $45.
Every Heater GUARANTEED.

Set a heater for every gas consumer. You will please them and increase sale of gas at the same time.

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Kalamazoo, Mich.,

The only manufacturers in the World of a COMPLETE LINE OF INSTANTANEOUS WATER HEATERS.

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Draughtsman and Constructing Engineer.

Drawings, Specifications and Estimates furnished for the construction of new works or alteration of old works. Special attention given to Patent Office drawings.

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AMERICAN METER CO.,

NEW YORK, ST. LOUIS, PHILADELPHIA, SAN FRANCISCO, CHICAGO,

Photometrical and Experimental Apparatus.

PUBLIC LIGHTING TABLE.

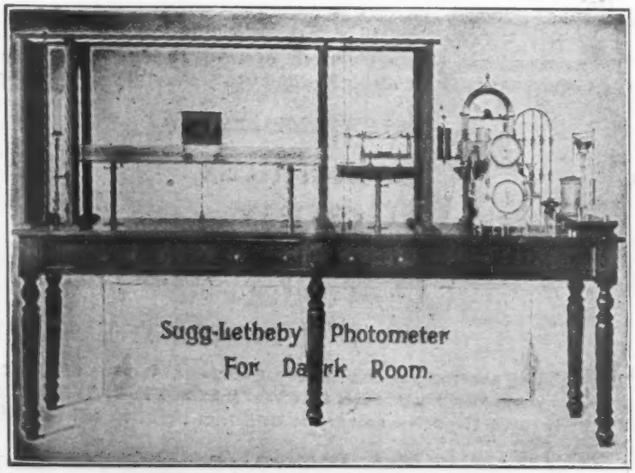
AUGUST, 1905.

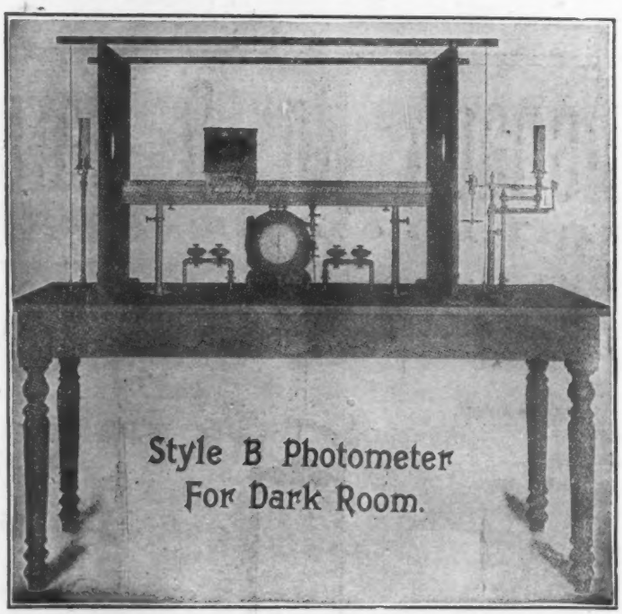
Day of Week.	Table No. 1. FOLLOWING THE MOON. Date.	Light.	Extinguish.
Tue.	1	7.40 PM	4.00 AM
Wed.	2	7.40	4.00
Thu.	3	7.40	4.00
Fri.	4	7.40	4.00
Sat.	5	9.10	4.00
Sun.	6	9.40	4.10
Mon.	7	10.20 FQ	4.10
Tue.	8	11.00	4.10
Wed.	9	11.50	4.10
Thu.	10	12.40 AM	4.10
Fri.	11	1.30	4.10
Sat.	12	2.30	4.10
Sun.	13	No L.	No L.
Mon.	14	No L. FM	No L.
Tue.	15	No L.	No L.
Wed.	16	7.30 PM	8.50 PM
Thu.	17	7.30	9.20
Fri.	18	7.30	9.50
Sat.	19	7.30	10.20
Sun.	20	7.20	10.50
Mon.	21	7.20	11.20
Tue.	22	7.20 LQ	12.00
Wed.	23	7.20	12.30 AM
Thu.	24	7.20	1.20
Fri.	25	7.20	2.10
Sat.	26	7.20	3.00
Sun.	27	7.10	4.20
Mon.	28	7.10	4.20
Tue.	29	7.10	4.20
Wed.	30	7.10 NM	4.20
Thu.	31	7 10	4.20

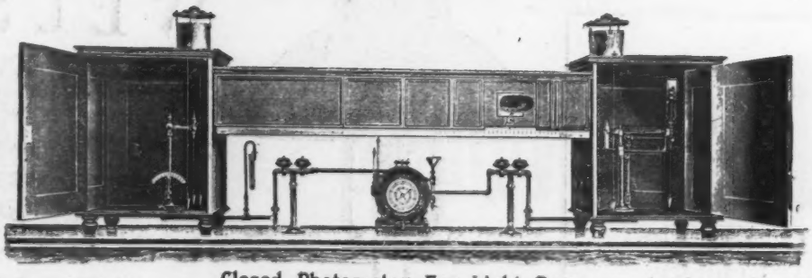
TOTAL HOURS DURING 1905.

By Table No. 1.

	Hrs.Min.
January	240.50
February	192.20
March	207.00
April	175.10
May	161.00
June	139.50
July	149.00
August	161.50
September	173.00
October	205.00
November	211.00
December	229.00
Total, yr.	2245.00







Closed Photometer For Light Room.

CIRCULARS SENT ON REQUEST.

PUBLIC LIGHTING TABLE.

AUGUST, 1905.

Day of Week.	Table No. 2. NEW YORK CITY. All Night Lighting. Date.	Light	Extinguish.
		P.M.	A.M.
Tue.	1	7.10	3.30
Wed.	2	7.10	3.30
Thu.	3	7.10	3.30
Fri.	4	7.10	3.30
Sat.	5	7.10	3.30
Sun.	6	7.10	3.45
Mon.	7	7.10	3.45
Tue.	8	7.10	3.45
Wed.	9	7.10	3.45
Thu.	10	7.10	3.45
Fri.	11	7.10	3.45
Sat.	12	7.10	3.45
Sun.	13	6.55	4.00
Mon.	14	6.55	4.00
Tue.	15	6.55	4.00
Wed.	16	6.55	4.00
Thu.	17	6.55	4.00
Fri.	18	6.55	4.00
Sat.	19	6.55	4.00
Sun.	20	6.45	4.10
Mon.	21	6.45	4.10
Tue.	22	6.45	4.10
Wed.	23	6.45	4.10
Thu.	24	6.45	4.10
Fri.	25	6.45	4.10
Sat.	26	6.45	4.10
Sun.	27	6.30	4.20
Mon.	28	6.30	4.20
Tue.	29	6.30	4.20
Wed.	30	6.30	4.20
Thu.	31	6.30	4.20

TOTAL HOURS DURING 1905.

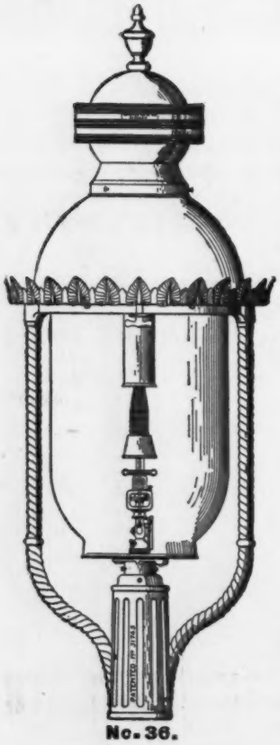
By Table No. 2.

	Hrs.Min.
January	423.20
February	355.25
March	355.35
April	298.50
May	264.50
June	234.25
July	243.45
August	280.25
September	321.15
October	374.30
November	401.40
December	433.45
Total, yr.	3987.45

NEW YORK, 97 Liberty Street. BOSTON, 814 Beacon Building. PHILADELPHIA, Broad and Arch Streets. ST. LOUIS, 712 Roe Building. CHICAGO, Foot of Orleans Street. SAN FRANCISCO, 712 Polk Street.

WELSBACH STREET LIGHTING COMPANY

.... OF AMERICA ....



No. 36.

Controls and Operates the

Welsbach System of Street Lighting,

Which includes its specially DESIGNED AND PATENTED BURNER for STREET and PARK LIGHTING exclusively.

Uniformly SUCCESSFUL in 150 Cities and Towns.

By means of the Welsbach System of street lighting the superiority of GAS over electricity for street lighting has been fully demonstrated.

POINTS OF MERIT:

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IT LIGHTS THE STREET.

Where there are no gas mains we can furnish an equally good light by our SELF-GENERATING NAPHTHA WELSBACH BURNER, and thereby supply a uniform light in all localities.

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The Welsbach No. 6 Harp Fixture.

AN IDEAL LIGHT FOR DINING OR LIVING ROOMS.

THE HIGHEST MECHANICAL INGENUITY COMBINED WITH ORNAMENTAL BEAUTY--THE NEWEST OUTPUT FROM THE WELSBACH FACTORIES.

Equipped with new model No. 66 high candle power Welsbach Burner.

Side Pilot By-pass Tube covered with refractory sleeve to prevent bending.

Fourteen-inch Opal Dome Shade.

Polished Brass Embossed Crown 2¼ inches high.

Length of Fixture, 30 inches.

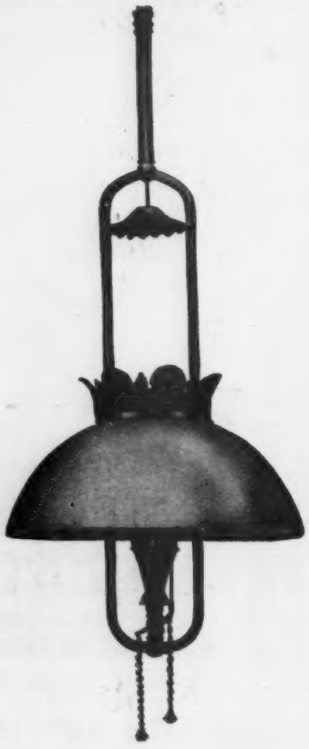
Width of Harp, 4½ inches.

Finished in Polished Brass.

Packed One Dozen to the Case.

List Price, per Dozen, $45 00.

We recommend equipping the No. 6 Harp Fixture with No. 4197 Intensive Brand Mantle, and the No. 306 **F. Q. M.** Clear Glass Air-Hole Cylinder.



Although the 14-inch Opal Dome Shade is standard equipment, we are prepared to furnish Dome Shades in green, pink or yellow (opal lined), and will be glad to quote prices.

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Springfield, Ills.	**Ludington, Mich.**	**Indianapolis, Ind.** (2d contract).
Oneonta, N. Y. (2d contract).	**New York,** Mutual Co. (2d contract).	**Hazleton, Pa.**
Pottsville, Pa. (2d contract).	**St. Louis, Mo.** (4th contract).	**Mahanoy City, Pa.**
Evansville, Ind. (2d contract).	**Sioux City, Ia.** (3d contract).	**Nanticoke, Pa.**

TOTAL SETS TO JULY 1ST, 1905, ... 585

TOTAL DAILY CAPACITY TO JULY 1ST, 1905, . 455,980,000 CU. FT.

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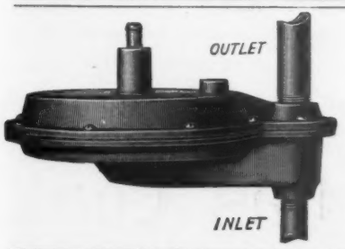

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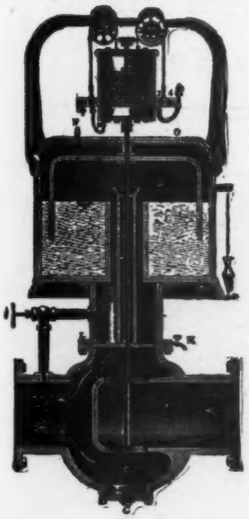

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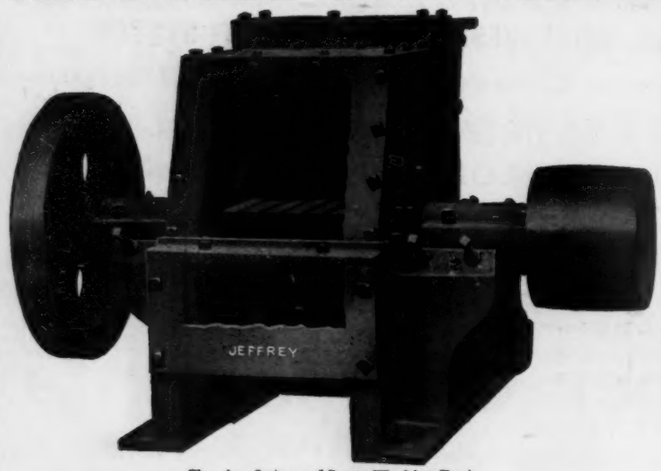

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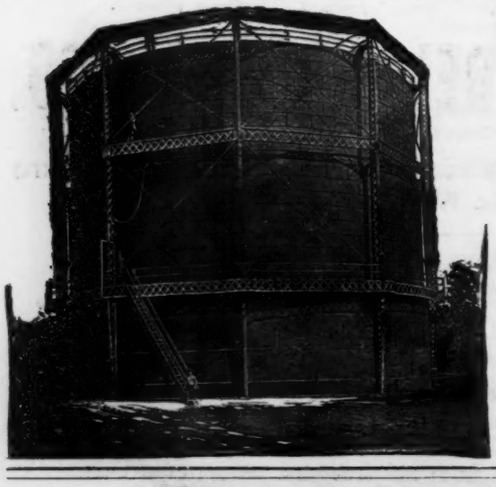

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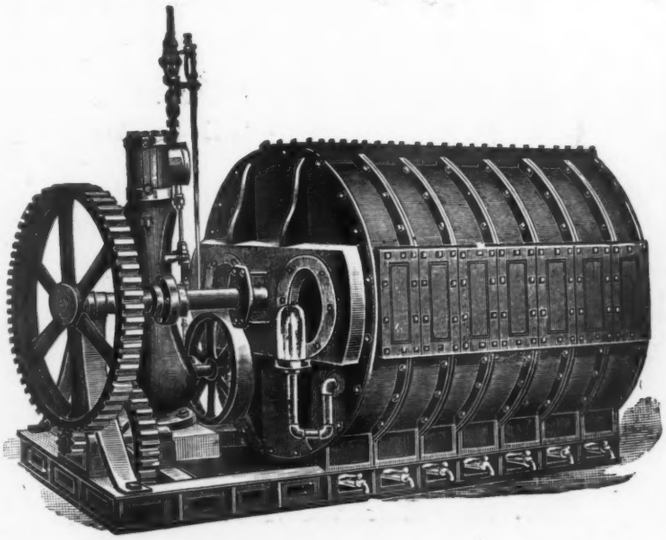

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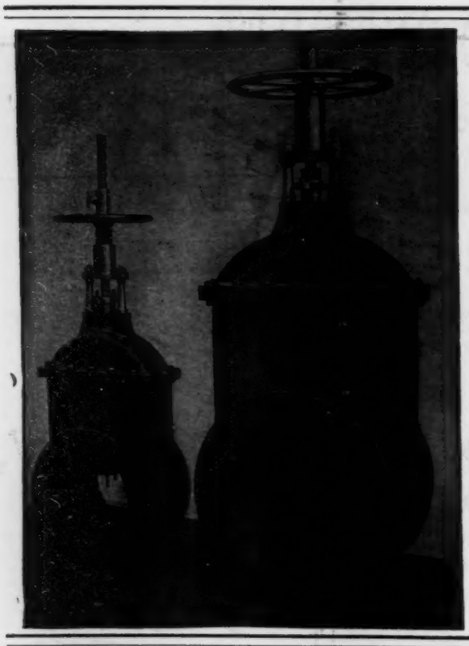

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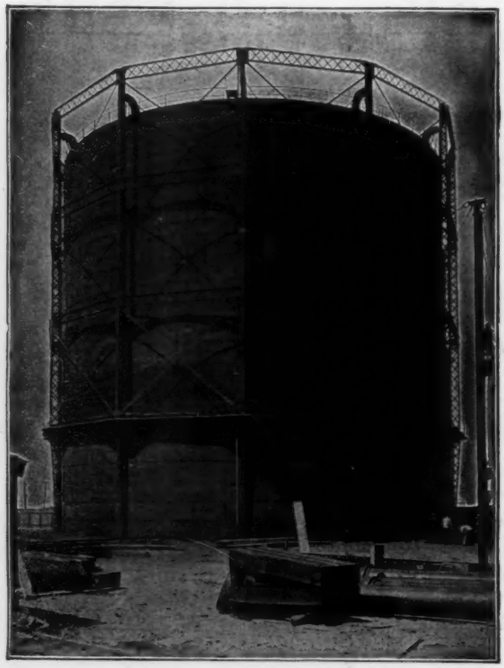

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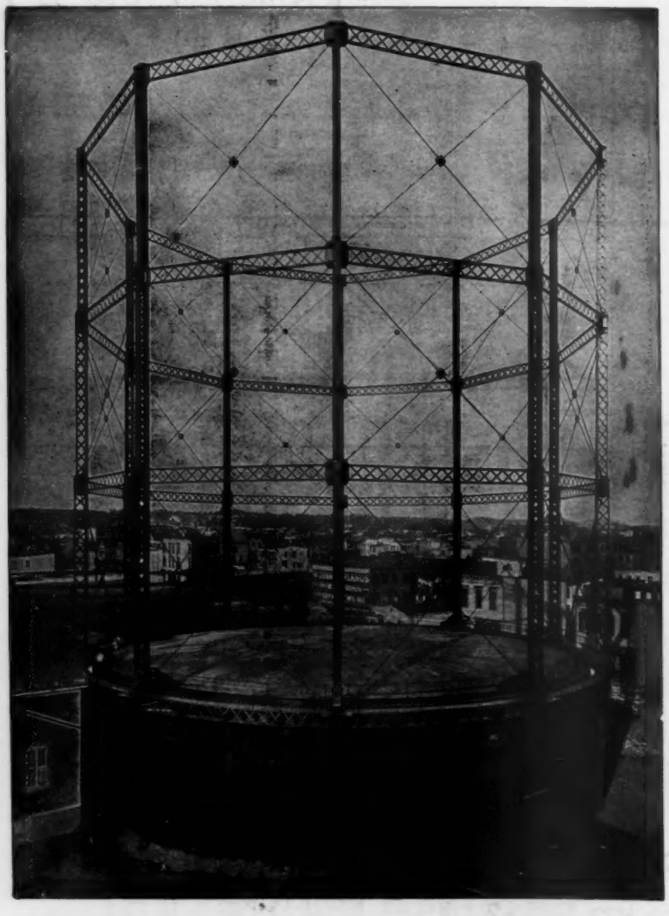

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